GENERAL EDUCATION COMPETENCIES
FOR PROFESSIONAL BACCALAUREATE STUDENTS

By

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General education has been a controversial issue in higher education for centuries and has been a focus of concern in most of the 1980s reports on education. Although the benefits are well documented, specific outcomes expected of general education for undergraduate professional students have not been well defined. This research was undertaken to determine the importance placed on general education competencies expected of professional baccalaureate students by 10 professional and liberal arts faculty groups.

The random sample for this study was drawn from professional and liberal arts faculty populations teaching in land-grant institutions nationwide. The research instrument developed was based on six previous studies of general education conducted over a 36-year period. Faculty rated each of the 34 general education competencies on a Likert-type scale. Data from 620 usable returns were analyzed.

Significant differences were demonstrated in the degree of value placed on most of the competencies when faculty were grouped by professional area and gender, but not by rank, highest degree earned, or age. Liberal arts faculty, together with nursing and home economics faculty, rated more of the competencies higher than other groups. Agriculture and engineering faculty rated more of the competencies lower than other groups. Women placed significantly more value on 24 of the competencies, and men placed more value on only one.

Analysis by rank ordering demonstrated that all faculty groups rated the following competencies as most important: reading critically and with understanding, clear and effective oral and written expression, reasoning and problem analysis, the ability to acquire and use knowledge, and a desire for growth and continued learning. At present, these most highly regarded competencies receive little emphasis in formal curricula.

Although agreement varies, four of the five competencies ranked lowest by the whole sample were explicitly or implicitly concerned with global interconnectedness. These competencies include awareness of the distribution of the world's resources, appreciation of the fine arts as forms of expression, the significance of language as reflective of culture, and exposure to a foreign language.

CHAPTER 1
THE RESEARCH PROBLEM

Widespread skepticism about the quality and effectiveness of American higher education has resulted in a number of recent reports on its status and condition (Carnegie Foundation, 1977; Integrity, 1985; Involvement, 1984; Boyer, 1986; Transforming, 1986). Criticism has been leveled variously at faculty, students, administrators, curricula of higher education, and secondary preparation. One recurring theme of these reports is the purpose of general education in the baccalaureate curriculum.

Although general education studies once comprised the entire undergraduate curriculum and were the sole program for higher education, today these studies compete with the various specialty and professional areas for meaning and survival. The literature is replete with ideas and opinions about various outcomes of general education in the undergraduate curriculum, but as professional education has received increasing priority over general studies, the result is that the "function and character [of general education] are not well understood" (Carnegie Foundation, 1977, p. 182).

Although there is little doubt that professional and general education studies will continue to be offered within the university setting, the role and mission of general education continues to be confused and uncertain. Although the benefits of general education are well documented in the literature (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962), specific competencies expected of undergraduates as a result of these studies do not appear to have been studied, and confusion still exists on campuses about the specific outcomes desired from liberal education. In support of this thesis, a recent descriptive pilot survey of liberal arts and nursing faculty and recent baccalaureate graduates indicated that neither faculty nor students could specifically or clearly articulate the competencies to be derived from general education (Gross, 1986).

Controversies over general education have existed for many years. Addressing this issue in the late 1950s and early 1960s, the Institute of Higher Education of Teachers College, Columbia University, published a series of studies designed to investigate the amount and kind of general education studies desired in professional curricula. Attitudes about credit hours, sequencing, and the desirability of including specific courses in undergraduate curricula were surveyed (Dressel & Lorimer, 1960; Dressel, Mayhew, & McGrath, 1959). In general, researchers concluded that both liberal arts faculty and professional faculty valued liberal studies for professional students. The 1959 study by Dressel, Mayhew, and McGrath was replicated in 1978 by Lyons, and again faculty support of general education for professional students was clear, although a diminution of this support had occurred over the 20 years between the studies. In both studies, however, considerable disagreement was found among faculty about the relative importance of various subject areas and a tendency was documented for professional faculty to favor general education subjects supporting their own specialty areas.

Foci of these studies were directed at administrative aspects of general education and were related to course offerings, credit hours, and desired sequencing. Areas of agreement and disagreement among various faculty groups were identified and posed a means for dialogue and curriculum planning. These studies were not intended to address specific competencies expected of professional baccalaureate students as outcomes of the general education component of the undergraduate curriculum. The question still remains: what characteristics are expected or desired of students as a result of their general education studies?

Rationale for the Study

Although a number of experts have identified specific general education competencies expected of undergraduate students (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962), faculty expectations of students have not been researched. The purpose of this study was to investigate the opinions of professional and general education faculty groups about the relative importance of specific competencies as desired outcomes of general education for professional students in baccalaureate programs. Because the plethora of recent reports on higher education indicates considerable concern for general education (Boyer, 1987; Carnegie Foundation, 1977; Integrity, 1985; Involvement, 1984; Transforming, 1986), this investigation is timely.

Clarification of expected competencies as goals of general education can serve a number of functions. Identification of desired competencies removes curricular discussions from discipline-specific considerations and territorial issues to foci on desired characteristics of college graduates. Results of such a study can provide information about areas of mutual agreement among diverse faculty groups, thereby posing a starting place for meaningful dialogue. These data might also suggest a means for the restructuring of knowledge areas in undergraduate education. A competency-focused approach to achieving general education goals may also be of value for addressing the educational needs of a diverse student body and one which is scattered throughout numerous professional schools in large universities. For educational leaders anticipating curricular review or revision, knowledge of the relative importance of general education competencies to faculty groups can provide groundwork for deliberation.

Statement of the Problem

This study was undertaken to determine the importance placed on specific general education competencies expected of professional baccalaureate students by professional and general education faculty groups.

Study Questions

Specifically, this study was designed to answer the following questions:

1. Are there differences in the relative importance placed on general education competencies by faculty groups that are related to differences in their professional orientation, rank, highest degree earned, age, and gender?

2. How similar are the rank ordering of general education competencies by faculty groups with different professional orientations?

3. How do faculty groups cluster together based on ratings of their opinions about the importance of general education competencies for undergraduate professional students?

Definitions

In order to define general education adequately, definition of related terms is necessary.

Liberal Arts

Although there is continuing controversy over the elements comprising the liberal arts, they are generally accepted to be comprised of the humanities, the social sciences, and the natural sciences. They are discipline specific and, according to Dressel (1979), when discussed in higher education, they have a tendency to become ends in themselves (the student has satisfied three credits of English and six credits of history), rather than learnings designated to develop certain competencies.

Liberal Education

The word "liberal" is derived from the Latin "liberi," to free. Historically, the term was used to describe the education of the ruling class (or freemen) who devoted themselves to civic affairs and intellectual matters rather than perform manual labor for remuneration. The term today has come to refer to the total education of an individual, including the vocational element, because it prepares the individual to be self-sufficient or free (Brubacher, 1959; Harvard, 1945; Pillepich, 1962).

General Education

General education is "nonvocational, nonspecialized education for the preparation of intelligent, informed, responsible human beings and citizens of democracy" (Pillepich, 1962, p. 26). It is expected to prepare individuals to address effectively the persistent (nonvocational) situations comprising the human condition; that is, those conditions "general" to all. It is not associated with specific academic disciplines or administrative units and can vary from place to place and time to time. Definitions of general education are numerous and range in length and specificity. Pillepich's definition, based on her cogent analysis of the term, was used in this study.

Professional Education

For purposes of this study, professional education is defined as a college program leading to occupational entrance after study at the baccalaureate level. Such programs are generally 4 years in length (but may be longer) and are referred to as "professional," therefore separating them from nonoccupational study. Business, education, and nursing are examples of professional education programs.

Competency

A competency is an outcome or demonstration of adequate ability. The ability to communicate effectively is a generally accepted competency of general education. Lists of competencies have been proffered by various authorities of general education. Six of these expert authorities were relied upon in the development of this study. Their writings refer variously to these competencies or outcomes of general education as abilities (McGrath, 1959), goals (Boyer & Levine, 1981; McGrath, 1959), broad subject areas (Boyer & Levine, 1981), characteristics (Dressel, 1979; Harvard, 1945, 1978), traits (Harvard, 1945; McGrath, 1959), purposes (McGrath, 1959; Pillepich, 1962), outcomes (Boyer & Levine, 1981; Dressel, 1979), and competencies (Dressel, 1979).

Faculty Groups

Investigation in this study was aimed at seeking opinions of 10 groups of faculty. These groups were agriculture, business, education, engineering, home economics, journalism, music, nursing, pharmacy, and liberal arts faculty.

Organization of this Dissertation

This dissertation is organized into five chapters. Chapter 1 is an overview of the study. The purpose and rationale for the study have been presented. Included are the research questions and hypotheses and definitions of significant terms.

Chapter 2 is a review of the literature of general education with emphasis on the studies of Columbia University's Institute of Higher Education from which this study flows. A review of other significant studies related to general education are also included.

Chapter 3 contains a description of the research methodology, the process by which the list of specific competencies for the research instrument was developed, the processes of data analysis, and limitations of the study.

Chapter 4 contains results of the analysis of the data, and Chapter 5 contains the conclusions, discussion, and recommendations for further study.

CHAPTER 2
REVIEW OF THE LITERATURE

Many students enter college with professional goals established. Their interest and enthusiasm are primarily for their chosen occupational fields, and requirements to study in the liberal arts are viewed as intrusions in their career goals. Often they do not understand the goals of undergraduate education nor what is expected of them (Involvement, 1984). Even though the general education component is central to the mission of the American college, it is poorly understood by faculty as well as by students (Carnegie Foundation, 1977; Involvement, 1984). Most colleges and universities have articulated statements about institutional mission which directly or indirectly relate to general education. Such statements tend to be broad and vague and do not specify clear outcomes. They are often the only statements set forth by institutions of higher education which address the role of general education.

In recent years, renewed attention has been directed toward general education, and advocates have seen it as an integral part of professional education (Gaff, 1983). Most professional accrediting agencies define criteria requiring general education as a part of undergraduate professional education and, in fact, on the average, general education credits comprise about one-third of a professional baccalaureate curriculum.

Value of General Education to Professional Education

Although the value of general education is addressed often in the literature, and professional faculties clearly value general education for their students (Dressel, Mayhew, & McGrath, 1959; Lyons, 1978), investigation has demonstrated that faculty and students do not articulate these outcomes clearly. This finding was confirmed in a recent descriptive pilot survey of faculty and recent baccalaureate nursing graduates (Gross, 1986). In this survey, nursing faculty, liberal arts faculty, and recent graduates of baccalaureate nursing programs were asked what each considered to be the purposes of general education in the undergraduate nursing curriculum. Ten of the 12 respondents expressed and displayed by their words and actions, a high regard for a solid core of general education studies in the curriculum. Subjects responded in broad terms and only alluded to two of the six competencies identified by Boyer and Levine (1981) as desired outcomes of general education. While this survey supported earlier studies demonstrating the value placed on general education by faculty (Dressel, Mayhew, & McGrath, 1959; Lyons, 1978), faculty and students in the 1986 survey did not verbalize these purposes clearly or specifically.

History of General Education

Today the relationship of general education to professional education is grounded in the history of these two areas. An overview of the development of these relationships helps to clarify the present situation.

Early History

Differentiation was made between professional education and the liberal arts as long ago as Aristotle. Although Aristotle (1984 translation) said it was not clear what the aims of education should be, he was definite that vocational and liberal learning were different when he said:

> So it is evident that certain things should be learned and there should be education with a view to the leisure that is spent in pastime as well, and that these subjects of education and these sorts of learning should be for their own sake, those with a view to occupation being necessary and for the sake of other things. (Book 8, Chapter 3, p. 231)

In this country, higher education began at Harvard in 1636 and was rooted in English traditions. The early curriculum was highly prescribed and was based on the trivium and the quadrivium of the medieval university. These are described as the seven liberal arts and consisted of grammar, rhetoric, logic, arithmetic, geometry, music, and astronomy. This classical course of study was valued by the early colonists for the purpose of educating gentlemen and of providing a learned clergy (Morison, 1935). The assumption was that a future professional must be first a gentleman steeped in the arts and literature. This approach to higher education prevailed in America for nearly 200 years.

During the 19th century, in response to industrialization and growth, specialized knowledge became necessary to meet the changing needs of society. An egalitarian spirit whereby professional credentials were acquired without benefit of college study became common. The value of a classical education declined and threatened the existence of small, traditional liberal arts colleges. Professional and proprietary schools grew up to meet the needs of this dynamic growth. During this period, West Point (1802) and Rensselaer Polytechnic Institute (1824) were founded. These technical institutions educated professionals for the purpose of supporting a growing industrial nation. Thomas Jefferson introduced practical studies into the curriculum at the University of Virginia. These and similar developments served to emphasize an emerging commitment to technology and the applied sciences (Rudolph, 1984). These changes were met with resistance by supporters of the liberal arts curriculum.

In the latter 19th century, social forces combined to meet the needs of a rising industrial nation. With the enactment of the Morrill Act (1862) promoting the development of land-grant colleges, additional impetus was provided for the idea that specialists and experts were necessary to keep pace with the new technological age.

Ezra Cornell founded Cornell with a similar focus, offering a variety of practical studies. In 1869, Charles W. Eliot introduced the very controversial idea of an elective system into the Harvard curriculum, adding respectability to the academic speciality concept with the career goals orientation that we know today. Small, private, and traditional liberal arts colleges were forced to follow suit, offering vocational and technical courses for the first time. Faculties who taught in courses across the curriculum soon became responsible for particular portions of knowledge, a concept familiar to the present educational system.

General Education in the 20th Century

Professional schools, affirming the specialization concept, linked themselves to universities and liberal arts colleges. Into the 20th century, curriculum diversity with specialization became common and popular, offering greater and greater numbers of men and women the benefits of higher education, but often clouding traditional academic priorities (Rudolph, 1984).

The controversies over the place of professional education in institutions of higher education, however, did not end. Many influential educators took a stand on the new professionalism. One strong advocate for the inclusion of professional education within the university setting was John Dewey. He saw increased respectability in the vocations as they became undergirded with theory and moved away from apprenticeship training. One of Dewey's (1944) recurring themes was the idea that a major function of higher education in a democratic society is "seeing that the technical subjects which are now socially necessary acquire a humane direction" (p. 393). Whitehead (1936) also believed that in a complex society, education and knowledge need to be united with professional application. He said, "it is mid-summer madness on the part of universities to withdraw themselves from the closest contact with vocational practices" (p. 268). And the famous Spanish educator, Ortega y Gasset (1946) believed the university should encompass both the liberal and professional aspects of education.

As American higher education changed to meet the needs and pressures of the times, several attempts were made over the years to revitalize general education. Alexander Meiklejohn of Amherst was a major force supporting a reawakening of the liberal arts curricula, which led to changes at colleges such as Amherst, Columbia, Dartmouth, and Reed. Other schools followed suit. The movement eventually led to the development of the well-known experimental colleges such as Meiklejohn College at the University of Wisconsin, founded in 1927, and General College at the University of Minnesota, founded in 1932 (Boyer & Levine, 1981). Thorstein Veblen (1918) sought to preserve the university against intrusions from vocational and professional interests. Although he thought vocational training served an important function, he felt it had no place in a university--that it was foreign to and "at cross purposes with all scholarly aspiration" (p. 144). Robert Maynard Hutchins also opposed integrating specialized education with general education. In the 1930s, he linked the great books to survival of liberal learning at the University of Chicago. He believed that the modern college was too vocational and specialized and did not address the broad issues necessary to train the mind. Shortly thereafter, St. John's College in Maryland developed a similar curriculum which survives today (Rudolph, 1962).

As a part of this movement, the University of Florida, in 1935, established General College (later renamed University College) as the administrative unit for general education. It operated under its own dean and was responsible for all general education and preprofessional studies for the lower division. Within University College, general education was provided by a series of six prescribed and required comprehensive courses, which were developed to "give some unity and meaning to the beginner's program" (University Record, 1957, p. 117). This unit remained intact for over 40 years before it was dissolved in 1977 by a vote of the faculty senate (Proctor & Wright, 1986).

Harvard's 1945 General Education in a Free Society, commonly called the "Red Book," was released and became another major force in the recurring general education controversy. The Red Book report, which proposed a core curriculum of general studies at Harvard, was widely acknowledged and criticized, and was ultimately rejected for implementation by the faculty. Nationwide interest in the concept was great, however, and many high schools and colleges adopted variations of the Red Book recommendations (Boyer & Levine, 1981). As recently as 1951, Mortimer Adler advocated exclusion of vocational training from higher education, saying that education should provide learning "for the sake of learning, not for the sake of earning [and that vocational training] should be done on the job" (p. 43).

Recent Influences on General Education

These many statements supporting the value of traditional liberal arts education were not made in isolation. General education is in a continual state of review. It responds to the pressures and events of the times, sometimes moving in one direction, sometimes in the other. A number of social, political, and economic factors have, over the years, put pressures on higher education which have threatened general studies. The great wars of the 20th century, the Depression, the influence of access by social change and by government support, and the advances in technology exemplified so clearly by the USSR's launching of Sputnik in 1957 were major forces which tended to increase the perceived value of specialization. In fact, the student movement of the 1960s and 1970s reduced or eliminated the required curricular components of general education in many institutions. Students chose the courses they wanted, often with no thought to coherence or purpose, and faculty became more isolated within their specialty areas, confirming curricular chaos (Rudolph, 1984).

History clearly has demonstrated that global and societal influences greatly affect higher education, particularly the relationships of general education to professional education. The ebb and flow of these events have caused a reevaluation of general education offerings over the years. General education has been changed, adapted, and reworked to more adequately complement professional education and changing student populations. In the process, its quality has come again under criticism. As the professions become the primary focus of higher education, the question of the value and purposes of general education studies has been challenged and debated.

Related Reports and Studies

The question of the purposes of the general education component of professional education is a common theme in the literature. A number of reports and studies provide further background for this study.

The 1977 Carnegie Foundation report *Missions of the College Curriculum* described and analyzed a number of surveys and studies related to undergraduate education. In this report, it was stated that "no curricular concept is as central to the endeavors of the American college as general education, and none is so exasperatingly beyond the reach of general consensus and understanding" (p. 164). Although general education once comprised the entire curriculum, the report found that on most campuses it now is so "poorly defined and so diluted with options that it has no recognizable substance of its own" (p. 184), and that its purpose is not well understood but in fact is unclear. The report concludes, "if colleges cannot define what they intend to accomplish in general education, cannot specifically describe how it will benefit [students]" (p. 184), then perhaps it should be eliminated.

Reports of the 1980s

Involvement in Learning: Realizing the Potential of American Higher Education, a report from the National Institute of Education of the Department of Education (1984), addressed the difficulties facing educators as they attempt to provide adequate and effective higher education to more and more students. Among the recommendations were a number which, directly or indirectly, address the quality of general education for all students.

The 1985 study and report Integrity in the College Curriculum, by the Association of American Colleges, focuses on general education. This report states that general education programs, if they exist at all, lack "rationale and cohesion" (p. 3). Among their recommendations were a set of minimum experiences proposed to be necessary for all students. Of the nine suggested areas of competence, eight fall in the broad area of general education. The ninth is "study in depth" or the major (pp. 15-26).

The Education Commission of the States' recent report (1986) Transforming the State Role in Undergraduate Education, explored the states' role in the improvement of undergraduate education. One criticism addressed was that undergraduate education is not preparing students for "citizenship and social responsibility in a [complex] world" (p. 11). This report was concerned with the fact that the large majority of college students are enrolled in state institutions, making the states responsible for the education (K-12 and college) of most of the populace.

A recently published series of studies by the Carnegie Foundation for the Advancement of Teaching entitled, College: The Undergraduate Experience in America, by Boyer (1987) described the current situation in higher education. Boyer reported that, on most campuses, there has been a sharp division between general and special education. He said "the fragmentation and specialization of the academy" (p. 91) are the major roadblocks to an effective general education program and was critical of the distribution requirement approach to general education currently in place at over 90% of colleges and universities in the United States. He contended that students view general education as an "irritating interruption" (p. 102) and faculty tend to reinforce an unhealthy balance between general education and specialization. One major point of concern was the confusion over the goals of general education. Another concern raised was a poor understanding of the relationship between the educational experience and the real world.

Previous Research

In the late 1950s and early 1960s, the Institute of Higher Education at Columbia University undertook a series of studies which addressed faculty attitudes about general education in the baccalaureate curriculum. Of particular interest is the 1959 study by Dressel, Mayhew, and McGrath which examined attitudes of faculty from nine professional fields. These researchers found strong support for general education by the faculty groups, but also a tendency for these faculty to prefer liberal arts subjects which contributed to students' professional competence and therefore their own professional areas of interest.

As part of the same series, Dressel and Lorimer (1960) surveyed liberal arts faculty, using a nearly similar format, and compared their responses to those of the professional faculty surveyed earlier. They found both liberal arts faculty and professional faculty clearly supported liberal arts requirements for undergraduate students, with liberal arts faculty slightly more supportive than professional faculty. Furthermore, they found liberal arts faculty apparently were unaware of the importance placed on the liberal arts by professional faculty. They concluded that attitudes of professional and liberal arts faculty groups were not as divergent as might be expected, and that collaboration between the two groups would be beneficial. These researchers also saw an urgent need for clarification of the purposes of general education.

Twenty years later, Lyons (1978) replicated the Dressel, Mayhew, and McGrath study of professional faculty. His findings were similar to the earlier study, although he found a diminution in the proportion of professional faculty expressing positive attitudes toward the liberal arts in their programs. As with the earlier study, he found that professional faculty tend to view liberal studies in terms of their relevance to one's own particular profession or field.

While these studies did provide information about faculty attitudes and opinions of general education, they addressed administrative aspects of general education, such as optimum number of credit hours, desired subject areas, and sequencing pattern. They did not attend to desired or actual outcomes of general education.

In 1962, Pillepich provided a different approach to the subject. The major purpose of this study was to determine to what extent baccalaureate nursing programs had accepted the minimum objectives commonly considered central to the purposes of general education. The rationale for this study was that "general education is the core, or essence, of all higher education" (p. 3). This researcher examined the objectives of 39 colleges of nursing and found only nine which included all four of the goals common to general education in the writings of expert educators. These four goals, she believed, "help to characterize the intelligent, informed, responsible human being and citizen" (p. 30). As a part of the same study, administrators' responses to a questionnaire indicated a "strongly positive attitude toward the importance of general education" (p. 47) but also a tendency to subordinate it to professional education. One finding of this study, according to Pillepich, was that nursing education administrators demonstrated considerable confusion over the purposes of general education. According to this researcher, nursing education administrators viewed general education as a foundation for professional practice.

Recently Bottoms (1983) addressed general education competencies as they have been applied to professional nursing practice as well as to the value such competencies hold for the personal lives of nurses. She examined professional and personal behaviors of nursing graduates in Iowa. She found that nurses educated at the baccalaureate level did exhibit more behaviors attributable to the liberally educated person in their personal and professional lives than nurses educated in diploma and associate degree programs. Variables in this study were self-reported behaviors believed by writers in the field to represent outcomes arising from liberal education. She did not address the desired outcomes of general education as perceived by educators.

In a rare survey of students, Gaff and Davis (1981) reported, as a part of the Project on General Education Models (Project GEM), that students valued a broad general education. Students in this study related general education to "other goals of specialized knowledge, a self-knowledge, and preparation for a career" (p. 122). They were critical, however, of "general education courses they have taken, especially required courses and those outside their majors" (p. 122), and they also expressed a desire to participate in decisions related to curriculum revision.

In a recent descriptive pilot survey (Gross, 1986), four liberal arts faculty, four nursing faculty, and two (of four) recent baccalaureate nursing graduates, supported the value of liberal arts study for baccalaureate nursing education. Without the prompting of cues from a survey, most of the purposes articulated for general education studies by informants were broad and non-specific. Typical responses were that general education produces "an educated person, increases one's options, provides a knowledge of life, [and] develops a well-educated person" (pp. 25-26). Specific purposes were articulated more often by nursing faculty and were related to the applicability such outcomes have for professional practice rather than for the value they have for an individual's life in general.

Professional Competencies

Stark, Lowther, and Hagerty (1986) sought to identify professional competencies considered generic outcomes of professional study in 12 fields. In this study, researchers explored the literature relating to professional preparation in professional fields, and they surveyed faculty in 10 of the areas with respect to "preferred outcomes and educational activities" (p. 4). Although these outcomes include general education concepts, they are viewed in the context of their value for professional practice rather than in their broader application to one's life as a responsible human being and citizen. The competencies developed can be helpful in comparative understandings of professional programs, especially as they affect interprogram curricular decisions at the preprofessional level (but not necessarily in the area of general education). One finding of this study was that, as in other studies, professional faculty do value the liberal arts contributions to their students' professional education and are seeking to integrate them with professional studies. These researchers also concluded that although professional preparation is concerned with outcomes because of licensing and accreditation requirements, liberal education outcomes are more difficult to measure. They believe "articulation of desired outcomes [is] a necessary precursor to measurement" (p. 79).

Summary of the Literature

There seems little doubt that great concern exists among educators about the condition of undergraduate education. General education is an area under particular attack. Both liberal arts faculty and professional faculty clearly support general education in undergraduate curricula, and their attitudes are similar in terms of overall value and administration of general education curricula.

However, faculty teaching in professional programs appear to have a tendency to value liberal studies which contribute to professional education. What is not so clear is the view of faculty about the specific purposes of the general education for the total lives of their students. Although the literature is replete with statements about various competencies expected of general education, faculty expectations of students' behaviors and characteristics as college graduates, professionals, and human beings are not at all clear.

The purposes of American higher education are rooted in a philosophy based on a broad general education, and most institutions of higher education acknowledge that fact in mission statements. However, the emphasis on professional education in today's society is accompanied by confusion over the purposes of general education in the undergraduate curriculum, especially for professional students. Determination of the importance placed on specific general education competencies by faculty groups is expected to clarify points of mutual agreement and disagreement and provide a basis for meaningful dialogue.

According to Boyer (1987), a comprehensive general education program may be achieved in a variety of ways, but he says "it is the clarity of purpose that is crucial" (p. 101). He goes on to say,

> in the end, integrating the liberal and the useful arts depends every bit as much on people as on programs. Courses alone do not bring coherence. Faculty must provide the enlightening and integrative foundation so

> essential to a successful undergraduate experience. They should not only be devoted to their disciplines but also embody and exemplify in the classroom the spirit of a liberal education. (p. 115)

In a 1977 Journal of General Education article, Berry stated that students cannot be expected to carry the burden for making the broad connections between curricular components. He believed that institutions should enhance coherence in the educational experience, and should help students by "responding confidently to inquiries about what it is that studying the liberal arts prepares a person to do" (p. 234). The present investigation is one step in this direction.

CHAPTER 3
RESEARCH METHODOLOGY

The major purpose of this study was to investigate the opinions of professional and general education faculty groups about the relative importance of specific competencies as desired outcomes of general education for professional baccalaureate students. This study emerged from the growing realization that studies of general education have focused on administration, specific curricular components, and attitudes about general education but not explicitly on desired student outcomes of general education. While a number of listings of competencies of general education are found in the literature, they rarely have been based on research. Further, comparisons of the opinions of various faculty groups on the subject do not appear to have been made. Because it was found that students and faculty do not clearly articulate specific outcomes of general education in the absence of cues from a survey tool (Gross, 1986), this study provided respondents with a set of specific competencies. Opinions from the various faculty groups were compared and associations and comparisons were made.

Survey Instrument

The competencies of general education developed for this study are grounded in the literature. Purposes (or goals or expected competencies) of general education have been proposed by a number of experts and expert groups. Their listings vary in length and detail. Many of the statements are broad, sometimes described by specific example but often allowing wide interpretation. The writings of the various authorities upon which this study is based (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962) were published over a 36-year span. The Pillepich list is short, comprised of broad and nonspecific statements. She compiled her list with reference to seven other authorities. The Boyer and Levine list includes several competencies not mentioned by other writers. In spite of these variations, there is considerable consensus among the writings about the competencies expected as a result of undergraduate education. The final list compiled for this research utilized only items supported by two or more of the authorities.

Because of the variety of verbal expression in the writings of these experts, some liberty has been taken in developing the list of competencies examined in this study. One cannot therefore assume that each of the authorities would support each of the statements, although there is no reason to believe that any would disagree with an item. The final list contains 34 competencies and are listed below in like-groupings. Each competency is followed by the citations of the experts supporting that statement.

Communication

1. A graduate has an understanding of the basic concepts of numbers and quantity and has skill in their use (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

2. A graduate has had some exposure to a foreign language (Boyer & Levine, 1981; Pillepich, 1962).

3. A graduate has an appreciation of the fine arts as forms of expression (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

4. A graduate is literate in basic computer skills (Boyer & Levine, 1981; McGrath, 1959).

5. A graduate can express thoughts and ideas in oral and written form clearly and effectively (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

6. A graduate can read critically and with understanding (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959).

7. A graduate understands the value of language as reflective of cultural values and traditions (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959; Pillepich, 1962).

Resources and the Environment

8. A graduate is aware of and concerned about the impact of the world's population on natural resources and the environment (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959).

9. A graduate has some understanding of and concern for the power of science, technology, and natural forces to benefit and complicate our lives (Boyer & Levine, 1981; McGrath, 1959; Pillepich, 1962).

Lifelong Learning

10. A graduate knows how to acquire knowledge and how to use it (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945; McGrath, 1959).

11. A graduate is aware of his or her own limitations (Harvard, 1945; McGrath, 1959).

12. A graduate has a desire to learn and grow (Dressel, 1979; Harvard, 1945; McGrath, 1959).

Reasoning and Critical Thinking

13. A graduate understands scientific methodology and how new knowledge is formed (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

14. A graduate is able to reason and analyze problems critically and logically (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

Citizenship

15. A graduate is informed and concerned about civic matters (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

16. A graduate has an understanding of the process of group membership, the significance of formal association in our lives, and

the rewards, obligations, and risks of formal institutions (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

17. A graduate has an understanding of governmental processes (federal, state, and local) (Dressel, 1979; McGrath, 1959; Pillepich, 1962).

18. A graduate is motivated to cooperate and collaborate with others in analyzing problems, seeking solutions, and taking action on them (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945; McGrath, 1959).

Values and Beliefs

19. A graduate understands the distinctions between beliefs and facts (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959).

20. A graduate understands how values are formed, changed, and passed on to others (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959).

21. A graduate understands how society responds to unpopular or contrasting beliefs and values (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959).

22. A graduate has some understanding of the influence of religious, social, and political ideologies (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

23. A graduate has the ability to examine his or her own values and beliefs (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

24. A graduate respects the differing beliefs, values, and views of others (Dressel, 1979; Harvard, 1945; McGrath, 1959; Pillepich, 1962).

25. A graduate has at least a provisional philosophy of life (Boyer & Levine, 1981; Harvard, 1945; McGrath, 1959; Pillepich, 1962).

26. A graduate has some understanding of and experience in thinking about moral and ethnical problems (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959).

Times and Cultures

27. A graduate has some understanding of the similarities and differences among the peoples of the world (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

28. A graduate has some understanding of human motivation and how it affects behavior (Harvard, 1945; McGrath, 1959; Pillepich, 1962).

29. A graduate has some knowledge of another culture and how it compares to one's own (Boyer & Levine, 1981; Harvard, 1978; McGrath, 1959).

30. A graduate understands how the past has shaped the present and how today's world and decisions might influence the future (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

Interdependence

32. A graduate recognizes the economic interdependence of the peoples of the world (Boyer & Levine, 1981; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962).

33. A graduate is aware that the decisions of individuals and societies may impact on others (Boyer & Levine, 1981; Harvard, 1978).

34. A graduate is aware of the economic forces which influence distribution of the world's resources (Harvard, 1978; Pillepich, 1962).

As much as possible, the competency statements were constructed to avoid reference to particular disciplines thereby reducing any association with specific course offerings and credit hours and territorial issues. Neither do the statements define a level of competence, which allows for broad interpretation of items by respondents. Adequate competence is viewed as an institutional or faculty decision.

The survey instrument is found in Appendix A and is composed of the 34 competencies cited above but listed in random order. Further reference to the competencies in analysis and discussion utilizes the numbering sequence from the survey instrument found in Appendix A and not the numbering from the preceding list.

Respondents were asked to rate each competency on a 4-point Likert scale. Such a scale allows for gradations of opinion, is easily adapted to the nature of this research, and permits quick and easy response by subjects. According to Fox (1969), use of such a scale is based on the assumption that the category labels (such as extremely important, rather important, slightly important) communicate the same message to all respondents. However, he viewed a verbal scale to be preferable to a numeric one because "it elicits a clear statement of position on the continuum from each respondent" (p. 598). The stem of each item included a value or direction. Respondents were asked to indicate a level of agreement. A range of alternatives was utilized to increase variability.

Cliff (1959) found scale values associated with evaluative adverb-adjective combinations to be "highly reliable, highly comparable between groups, and highly correlated with scale values obtained by paired comparisons" (p. 43). Adverb descripters utilized for this study drew on Cliff's work. The adverbs chosen (slightly, rather, decidedly, and extremely) had nearly equidistant weightings in the three groups studied by Cliff.

The rating scale was used for this research because it allowed for ease of response and also because it yielded two kinds of data. The resulting scores were used for comparisons and also served as the basis for rank ordering items through the use of mean scores. Both of these uses were made of the data in this study.

Survey data are prone to error from a variety of sources. Misunderstanding of the items, incorrectly keyed responses, omitted data, non-responses, and a poorly constructed instrument are examples of common sources of error in survey research. On the other hand, a survey has certain advantages over the interview format. It permits collection of data from a large number of widely dispersed subjects at relatively little expense; it is impersonal and therefore can be expected to be reasonably objective; and standardization makes uniformity of administration more likely. Because an earlier descriptive survey undertaken in interview format indicated that neither faculty nor students could articulate competencies clearly or specifically without cues from the interviewer (Gross, 1986), the printed survey was chosen for this research.

Reliability and Validity

The reliability and validity of the survey instrument were estimated prior to the study. Reliability refers to the consistency of measurement and indicates the extent to which results of repeated administration, under similar circumstances, are similar. Reliability of this instrument was measured by test-retest methodology with a week separating test administrations. Nine subjects participated in the reliability testing which was calculated at 0.69.

Validity is "the extent to which the procedure actually accomplishes what it seeks to accomplish or measures what it seeks to measure" (Fox, 1969, p. 367). Content validity of this instrument was assessed by consultation with two liberal arts faculty and one administrator, all experts in the area of general education. A number of changes were made in the wording of the items based on the suggestions of these experts. Substantive change did not result from this review, but clarification and ease of use of the tool were significantly enhanced.

Further internal validation of the instrument was affirmed during data analysis when a significant association of responses to similar pairs of competencies was demonstrated by chi-square analyses. These associations are summarized in Table 3-1.

Table 3-1

Chi-Square Analysis Demonstrating Association of Similar Pairs of Competencies

Competencies by Number	chi-square	df	P value
1 x 14	222.848	9	0.000*
3 x 19	66.996	9	0.000*
3 x 20	100.839	9	0.000*
3 x 29	279.425	9	0.000*
7 x 13	112.894	9	0.000*
11 x 34	381.710	9	0.000*
19 x 20	178.243	9	0.000*
19 x 29	50.024	9	0.000*
20 x 29	121.862	9	0.000*
24 x 27	195.360	9	0.000*
28 x 30	192.569	9	0.000*

*$p < .05$.

These data indicate that subjects responded in a similar manner to similar items. For instance, items 3, 19, 20, 29, all address the broad area of citizenship in some way. Items 28 and 30 are related to lifelong learning. Items 7 and 13 address values and beliefs. Chi-square analyses of responses to similar pairs of these items are all significant at $p<0.000$ indicating that faculty were consistent in their responses. As previously noted, the competencies were listed randomly in the mailed survey and were not presented to respondents in like-groupings. These data indicate that respondents were consistent in their reactions to like items.

Sample

The sample was drawn from land-grant institutions of higher education nationwide. Two institutions were selected randomly from each of the geographic areas served by the regional institutional accrediting bodies (Middle States Association of Colleges and Schools, North Central Association of Colleges and Schools, New England Association of Schools and Colleges, Northwest Association of Schools and Colleges, Southern Association of Colleges and Schools, and the Western Association of Schools and Colleges).

The study population was comprised of all faculty within the selected land-grant institutions from the following professional schools which were listed by Harris (1987) as accredited by the professional accrediting bodies: agriculture, business, education, engineering, home economics, journalism, music, nursing, and pharmacy. These schools were selected because each offers professional education at the baccalaureate level, and because comparisons could be made with earlier studies which used the same professional areas (Dressel & Lorimer, 1960; Dressel, Mayhew, & McGrath, 1959; Lyons, 1978). In the original selection of institutions, two proved to contain no accredited professional schools listed by Harris. Since this criterion had been established for sample selection, these institutions were excluded from the study and were replaced with other institutions from within the same regional accrediting area.

Because of the difficulty of identifying faculty who teach general education courses, liberal arts faculty for this study were chosen from those faculty, from the same institutions, teaching in the broad areas of the natural and social sciences and the humanities. Specifically chosen were those faculty teaching in the areas of anthropology, biology, English, geography, history, humanities, literature, religion, speech, and sociology.

The population was drawn from institutional catalogs as found in College Catalog Collection on Microfiche (January 1986), An attempt was made to include only fulltime faculty. Faculty identified as adjuncts, lecturers, teaching associates, emeriti/ae, visitors, affiliates, or parttime were excluded from the population as they were more likely to be unavailable or unfamiliar with the educational goals of their institutions. When possible, department chairpersons were not included as their views are more likely to reflect institutional mission statements rather than personal views, and they are less likely to teach undergraduate courses than their faculty subordinates.

The sample was comprised of 120 subjects from the total population identified in each professional area and in the liberal arts and was selected using a table of random numbers. Because the populations of home economics, journalism, and pharmacy were less than 120, all members of these groups were surveyed. These groups are underrepresented in the study.

Data Collection

The survey instrument was mailed to 1012 subjects with a cover letter (Appendix A) describing the purpose of the research and assuring anonymity. The subjects' willingness to participate in the study was determined by their returns of the survey form. University of Florida, Institute of Higher Education stationery was used. Envelopes were addressed by hand and commemorative stamps were used. Participants were offered the opportunity to request a summary of the study results if they so desired. A postage-guaranteed, self-addressed envelope was included. Five weeks later a bright yellow follow-up postcard (Appendix A) was mailed to the 607 nonrespondents. Two weeks later a third mailing was sent to the 584 remaining nonrespondents. This mailing included an attention getting letter, a cover letter, and a survey instrument (Appendix A). After another 6 weeks, a final follow-up mailing with the survey instrument was sent to the remaining 408 nonrespondents (see Appendix A).

Of the 1012 original subjects, 620 usable surveys were eventually returned. Of the nonresponses, 72 surveys were returned unopened or were not usable. Of these, secretarial notes indicated that 22 subjects were ill, retired, deceased, or no longer taught in higher education. Several completed surveys were returned by subjects who no longer taught at the institutions with which they had been identified. These responses were not included in the data tabulations. Usable surveys were returned by 61% of the sample. Table 3-2 presents a summary of the frequency of response rate of the subjects by professional area.

Other independent variables utilized in this study were academic rank, highest degree earned, age, and gender. Tables 3-3, 3-4, 3-5, and 3-6 summarize these data by frequency and percent.

Further analysis of the demographic data by chi-square indicated several significant associations between the dependent variables (Table 3-7). Residual analyses of these associations are found in Appendix B. No significant association was found between professional area and age.

Table 3-2

Raw Frequency by Professional Area

Faculty Group	Total Sample	Usable Returns	Percent Response
Agriculture	120	96	80
Business	120	59	49
Education	120	78	65
Engineering	120	76	63
Home Economics	49	37	76
Journalism	26	14	54
Music	120	63	53
Nursing	120	71	59
Pharmacy	97	51	53
Liberal Arts	120	75	63
Totals	1012	620	

Table 3-3

Raw Frequency by Rank

Rank	Frequency	Percent
Professor	266	43
Associate Professor	200	32
Assistant Professor	123	20
Instructor	27	4
Missing responses	4	1
Totals	620	100

Table 3-4

Raw Frequency by Highest Degree Earned

Degree	Frequency	Percent
Doctorate	483	78
Master's	127	21
Other	10	2
Totals	620	101*

*Percentage varies from 100 due to rounding error.

Table 3-5

Raw Frequency by Age

Age	Frequency	Percent
<35	52	8
35-45	248	40
46-55	181	29
>55	137	22
Missing responses	2	
Totals	620	99*

*Percentage varies from 100 due to rounding error.

Table 3-6

Raw Frequency by Gender

Gender	Frequency	Percent
Male	447	72
Female	171	28
Missing responses	2	
Totals	620	100

Table 3-7

Chi-Square Associations between Independent Variables

Variable	Prof Area	Degree	Rank	Age	Gender
Degree	X =147.75 df=18 P=0.000*				
Rank	X =158.15 df=27 P=0.000*	X =178.90 df=6 P=0.000*			
Age	X =31.92 df=27 P=0.235	X =25.04 df=6 P=0.000*	X =216.33 df=9 P=0.000*		
Gender	X =270.77 df=9 P=0.000*	X =74.46 df=2 P0.000*	X =132.26 df=3 P=0.000*	X =10.58 df=3 P=0.014*	

The chi-square statistic and standardized residual analysis are used for data analysis throughout this research. Chi-square is a nonparametric procedure used to answer questions of relationship or association. It is based on the difference between the observed and expected frequencies. The independent chi-square statistic is used when more than one variable is involved, as in this research, and indicates if there is a significant relationship between the variables. Standardized residual is used for further analysis of the contingency tables. This statistic tells which cells vary most from the null hypothesis. It is calculated as the observed frequency minus the expected frequency divided by the square root of the expected frequencies.

To summarize the demographic data, results of this study indicate that educational level, rank, and gender varied significantly with professional area but age did not. Rank increased with educational level and with age. Men in this study hold the doctorate degree and higher rank more often than women. There are significantly more women in the lower age groups, and women in the sample are more likely than men to teach nursing and home economics.

Study Questions

The questions posed for study in this research are as follows:

1. Are there differences in the relative importance placed on general education competencies by faculty groups that are related to differences in their professional orientation, rank, highest degree earned, age, and gender?

2. How similar are the rank ordering of general education competencies by faculty groups with different professional orientations?

3. How do faculty groups by professional orientation cluster together based on ratings of their opinions about the importance of general education competencies for undergraduate professional students?

Data Analysis

Data from the survey forms were entered on an SPSS/PC file for statistical analysis. For each subject, data included an identification number, five demographic variables, and the 34 dependent variables. For the first study question, data were analyzed to determine if differences exist among faculty groups on the importance placed on each of the 34 competencies. For this analysis, faculty were grouped by professional area, rank, highest degree earned, age, and gender. The mean of the relative importance placed on each competency by each faculty group was calculated using the variates from the survey scale:

Slightly Important	1
Rather Important	2
Decidedly Important	3
Extremely Important	4

The chi-square statistic was used to determine significant variations among groups. The level of significance was placed at $p<.05$. Standardized residual analysis was used to identify specific points of difference.

For analysis of data for the second study question, the items were ranked according to the mean scores on the variables. The calculated means for each competency by each faculty group (nine professional areas and liberal arts) were assembled in rank order sequence and examined to determine if patterns were discernable. The mean for each competency for the total sample was also calculated.

For the third study question, hierarchical cluster analysis was utilized to determine which groups of faculty by professional area clustered together in distinct groups based on their ratings of the importance of the general education competencies. Hierarchical analysis is a statistical test which seeks to "search for relatively homogeneous groups of objects" (Norusis, 1988, p. B-17). Clusters are based on similarity of distance scores. For this analysis, squared Euclidean distance means of the variate were used. Squared Euclidean distance is "the sum of the squared differences over all of the variables" (Norusis, 1988, p. B-72). The criteria for forming the clusters was accomplished using the average between groups linkage method. This measure tells the distances between the pairs of cases or professional groups. Those groups which are most similar, or have the smallest differences between them, are paired first.

Limitations

For a number of reasons, the conclusions derived from this study can be accepted only tentatively. As with all research, the investigation is limited by the population studied. Results and conclusions are limited to the professional and liberal arts faculty teaching in land-grant institutions and may not be generalized to other faculty groups and types of institutions. While randomization of subjects was utilized, participation was voluntary. Results are limited by self-selection to those individuals willing to participate and may be biased. The possibility exists, for instance, that faculty participating in the study were more interested in general education than those who chose not to participate. As well, the researcher relied on the unbiased self-reports of the respondents for data. While there is no reason to believe that bias occurred, the possibility of distortion of data is inherent in any research. In addition, the response rate was 61%. The responses may have been significantly and systematically different from what might have been obtained from nonrespondents.

Another major issue to be overcome in the planning and implementation of this study was the development of a survey instrument which communicated succinctly and clearly the task of the respondent, and which also addressed the competencies traditionally considered to represent the goals of general education. Even the term "general education" is not necessarily understood by all faculty and therefore may have presented confusion by respondents. The research instrument for this study was developed by this researcher. Although it was tested for validity and reliability, it was untried. While an attempt was made to avoid discipline specific items, some of the competencies may have been identified with specific knowledge areas or courses. This fact could have prejudiced responses. There has also been an attempt to avoid articulating or implying a level of competence for the items on the survey instrument.

In addition, weightings of the items on the instrument were not considered. For instance, one competency describes oral and written communication while several address values and beliefs. Summary statistics on these data therefore have little meaning.

CHAPTER 4
RESULTS

The purpose of this study was to investigate the opinions of professional and general education faculty groups about the relative importance of specific competencies as desired outcomes of general education for professional baccalaureate students. Specifically, the investigator sought to determine if faculty vary in the importance placed on general education competencies according to their professional orientation, rank, highest degree earned, age, or gender. The association of the rank ordering of the competencies by the 10 faculty groups, when grouped by professional area, was also explored to determine if priorities about the importance of the competencies varied among the groups. Further analysis was accomplished for the purpose of identifying distinct clusters of faculty groups resulting from a similarity of responses. Findings for each question are reported in the following subsections.

Differences by Faculty Group

The first question posed was: Are there differences in the relative importance placed on general education competencies by faculty groups that are related to differences in their professional orientation, rank, highest degree earned, age, and gender?

Chi-square analyses were performed on the data to determine if faculty groups varied in their responses to the 34 competencies when grouped by professional orientation, rank, highest degree earned, age, or gender. Since one assumption of the chi-square test is that the distribution of observed numbers will approach normal, Snedecor and Cochran (1967) suggested assuring a minimum expected frequency of at least one in each class or category. In order to meet this condition, it was necessary to combine categories. The dependent variables "slightly important" and "rather important" were therefore combined for these analyses. In addition, journalism faculty were omitted from the chi-square of professional area because of their very small sample size (n=14). For analysis of differences by educational level (highest degree earned), the category "other" was omitted (n=10) to assure a minimum expected frequency of at least one. For chi-square analysis of rank, age, and gender all respondents (n=620) were utilized. The data for chi-square analysis of study question one are presented in Table 4-1. The level of significance was placed at $p < .05$.

It should be noted that in analysis of the data and in the discussion, the competencies are listed in the order found in the survey instrument in Appendix A. They are not listed in the order found in Chapter 3.

The data in Table 4-1 indicate that faculty do hold significantly differing opinions about the degree of importance they place on

Table 4-1

P Value by Chi-Square Analysis of Competencies by Various Faculty Groups

Competency	Professional Area (df=16)	Rank (df=9)	Degree	Age (df=9)	Gender (df=3)
1. complexity of human association	0.000*	0.323	0.094 (df=6)	0.703	0.001*
2. respect views of others	0.000*	0.360	0.956 (df=6)	0.735	0.000*
3. civic matters	0.015*	0.714	0.502 (df=6)	0.159	0.002*
4. examine own values and beliefs	0.000*	0.100	0.252 (df=6)	0.827	0.000*
5. peoples of the world	0.000*	0.979	0.209 (df=6)	0.309	0.006*
6. impact of decisions	0.000*	0.364	0.583 (df=6)	0.124	0.003*
7. formation of values	0.000*	0.715	0.403 (df=6)	0.018*	0.000*
8. another culture	0.000*	0.376	0.110 (df=6)	0.078	0.008*
9. numbers and quantity	0.000*	0.010*	0.002*(df=3)	0.508	0.024*
10. scientific method	0.000*	0.036*	0.008*(df=3)	0.872	0.362
11. economic interdependence	0.013*	0.040*	0.119 (df=3)	0.361	0.239
12. responds to beliefs and values	0.000*	0.358	0.102 (df=6)	0.630	0.000*
13. distinguish beliefs and facts	0.145	0.043*	0.259 (df=6)	0.186	0.285
14. human motivation	0.000*	0.885	0.002*(df=3)	0.335	0.000*

Table 4-1--Continued

Competency	Professional Area (df=16)	Rank (df=9)	Degree	Age (df=9)	Gender (df=3)
15. influence of the past	0.000*	0.491	0.468 (df=6)	0.172	0.005*
16. foreign language	0.000*	0.176	0.066 (df=6)	0.235	0.133
17. fine arts	0.000*	0.607	0.263 (df=6)	0.540	0.021*
18. computer skills	0.016*	0.127	0.085 (df=6)	0.866	0.513
19. collaborative problem solving	0.006*	0.044*	0.156 (df=6)	0.836	0.005*
20. group membership	0.000*	0.987	0.754 (df=6)	0.290	0.005*
21. aware of limitations	0.006*	0.028*	0.008*(df=3)	0.065	0.006*
22. language as reflective of culture	0.000*	0.355	0.273 (df=6)	0.177	0.000*
23. read	0.033*	0.308	0.432 (df=6)	0.027*	0.216
24. science, technology, and nature	0.000*	0.138	0.116 (df=6)	0.388	0.356
25. reason and analyze problems	0.169	0.672	0.861 (df=6)	0.338	0.695
26. understand ideologies	0.000*	0.643	0.159 (df=6)	0.499	0.004*
27. resources and environment	0.001*	0.027*	0.077 (df=6)	0.122	0.009*
28. acquire knowledge	0.006*	0.670	0.711 (df=6)	0.640	0.118
29. governmental processes	0.001*	0.648	0.005*(df=3)	0.408	0.000*

Table 4-1--Continued

Competency	Professional Area (df=16)	Rank (df=9)	Degree	Age (df=9)	Gender (df=3)
30. desire to learn and grow	0.021*	0.675	0.332 (df=6)	0.327	0.000*
31. moral and ethical problems	0.001*	0.406	0.849 (df=6)	0.553	0.000*
32. philosophy of life	0.000*	0.387	0.002*(df=3)	0.013*	0.002*
33. express thoughts and ideas	0.452	0.087	0.516 (df=6)	0.469	0.029*
34. world's resources	0.002*	0.545	0.054 (df=6)	0.091	0.021*

*$p < .05$.

specific general education competencies for undergraduate professional students. When grouped by specialty area, faculty differed in their ratings of all of the competencies except item 13, an understanding of the distinction between beliefs and facts; item 25, the ability to reason and analyze problems; and item 33, the ability to express thoughts and ideas orally and in writing. Ratings of these three competencies remained constant across the professional areas. When grouped by gender, faculty also differed significantly in their ratings of 25 of the 34 competencies. However, when grouped by rank, highest degree earned, or age, the opinions of the groups varied significantly on only a few of the competencies.

Further examination of the significant associations in these data was accomplished by standardized residual analyses. Standardized residual analysis assesses exactly where significant associations occur and is measured in standard deviations. Specific areas of significance ($p < .05$) are found in these tables when the standardized residual in a cell approaches or exceeds two standard deviations from zero ($> \pm 1.96$). The greater the value, negative or positive, the greater the deviation. Selected cross tabulations are found in Appendix C.

Rank Ordering

The second question posed was: How similar are the rank ordering of general education competencies by faculty groups with different professional orientations? Analysis of the data addressing this question utilized the mean ratings of the competencies within each professional group to rank the items. Mean ratings for each competency are found in Table C-1. The rankings of the items were also determined for the total sample. These data are presented in Table 4-2. The horizontal coordinate of this table lists professional area. The vertical coordinate lists the competencies, by number and by key words, in the order ranked by the means of the sample overall. The remaining 10 columns indicate, by professional area, the ranked order of the competency identified at the left. These data indicate that the same five competencies were ranked highest by all faculty groups with three exceptions. Three faculty groups ranked only one of these competencies below the top five. The five highest ranked competencies were:

1. Be able to read critically and with understanding (item #23).
2. Be able to express thoughts and ideas in oral and written form clearly and effectively (item #33).
3. Know how to acquire knowledge and how to use it (item #28).
4. Be able to reason and analyze problems critically and logically (item #25).
5. Have a desire to learn and to grow (item #30).

The exceptions were: journalism faculty ranked reading critically and with understanding sixth; nursing faculty ranked a desire to learn and

Table 4-2

Professional Area Table of Ranks

Comp #	Competency	Overall	AGRI	BUSN	EDUC	ENGN	HMEC	JOUR	MUSC	NURS	PHAR	LB ART
23	read	01	02	01	03	02	04	06	01	01	01	01
33	express thoughts and ideas	02	01	02	02	01	02	01	02	02	04	04
28	acquire knowledge	03	04	05	01	04	01	02	05	04	03	05
25	reason and analyze problems	04	03	03	05	03	05	03	09	03	02	02
30	desire to learn and grow	05	05	04	04	05	03	04	04	06	05	03
04	examine own values and beliefs	06	09	08	06	09	06	09	03	05	07	06
02	respect views of others	07	07	07	07	10	07	05	06	07	06	07
13	distinguish beliefs and facts	08	06	11	08	06	10	15	10	14	08	08
01	complexity of human association	09	13	06	09	16	08	12	07	08	15	14
31	moral and ethnical problems	10	14	10	13	13	12	07	11	11	14	10
06	impact of decisions	11	18	16	10	15	11	17	14	13	16	11
19	collaborative problem solving	12	11	17	11	12	09	26	17	10	13	32
21	aware of limitations	13	16	13	15	14	15	29	19	09	12	23
09	numbers and quantity	14	08	09	22	07	21	21	27	20	09	25

Table 4-2--Continued

Comp #	Competency	Overall	AGRI	BUSN	EDUC	ENGN	HMEC	JOUR	MUSC	NURS	PHAR	LB ART
15	influence of the past	15	20	14	19	19	16	10	13	19	17	09
05	peoples of the world	16	22	18	16	18	17	22	12	17	18	12
10	scientific method	17	12	20	18	08	25	32	32	15	10	21
24	science, technology, nature	18	10	22	25	11	24	20	25	18	11	19
14	human motivation	19	19	12	12	25	13	11	15	12	23	24
07	formation of values	20	28	27	14	23	19	16	20	16	19	15
03	civic matters	21	23	21	20	24	22	18	21	21	22	22
27	resources and environment	22	17	31	24	21	18	28	22	27	20	18
32	philosophy of life	23	26	29	17	29	14	19	16	22	30	26
08	another culture	24	30	28	26	26	27	23	18	25	25	13
18	computer skills	25	15	23	30	17	20	30	33	24	21	33
29	governmental processes	26	25	24	23	22	23	14	28	26	24	31
26	understand ideologies	27	27	25	27	28	28	08	23	29	29	17
11	economic interdependence	28	21	15	29	20	26	31	31	32	27	27

Table 4-2—Continued

Comp #	Competency	Overall	AGRI	BUSN	EDUC	ENGN	HMEC	JOUR	MUSC	NURS	PHAR	LB ART
12	responds to beliefs and values	29	29	30	21	31	32	13	29	23	26	20
34	world's resources	30	24	19	31	27	29	24	30	31	28	30
20	group membership	31	31	26	28	30	30	25	34	28	31	34
17	fine arts	32	33	32	33	33	31	33	08	33	32	29
22	language as reflective of culture	33	34	33	32	34	33	27	26	30	34	28
16	foreign language	34	32	34	34	32	34	34	24	34	33	16

to grow sixth; and music faculty ranked the ability to reason and analyze problems critically and logically ninth.

Consensus on the lowest ranked competencies was not as straightforward. The five competencies ranked lowest by the total sample were:

30. Be aware of the economic forces which influence distribution of the world's resources (item #34).

31. Have an understanding of the process of group membership, the significance of formal associations in our lives, and the rewards, obligations, and risks of formal association (item #20).

32. Have an appreciation of the fine arts as forms of expression (item #17).

33. Understand the significance of language as reflective of cultural values and traditions (item #22).

34. Have had some exposure to a foreign language (item #16).

Each of these items appear with considerable consistency near the bottom of the lists of each of the 10 faculty specialty groups, as can be seen by examining Table 4-2.

Item Analysis

An item analysis of the competencies follows. Differences among faculty when grouped by professional area, rank, highest degree earned, age, and gender are identified and described. To allow for further inspection, standardized residual cross tabulations of selected analyses are included in Appendix C. Additional information for item analysis was provided by rank ordering of the items.

Communication

Numbers and quantity. The importance placed on understanding the basic concepts of numbers and quantity (competency #9) differed significantly when faculty were grouped by professional area, rank, degree, and gender, but not by age (see item #9 in Table 4-1). As seen in Table C-2, music faculty rated number concepts lower than others, and pharmacy faculty rated it extremely important more often than others. As seen in Table C-3, assistant professors and instructors rated this competency decidedly important (3) more often than would be expected based on the responses of the entire group, and professors rated it extremely important more often than those in other ranks. Doctorally prepared faculty rated number concepts higher than master's prepared faculty. This competency is the only one rated significantly higher by men than by women.

Exposure to a foreign language and language as reflective of culture. These two competencies (#16 and #22) were valued the least by the faculty overall as can be seen by their low ranking in Table 4-2. Significant differences of opinion about the degree of value placed on these two competencies occurred between faculty groups by specialty area (see #16 and #22 in Table 4-1). Analysis by standardized residual indicates that the area of major difference among professional groups was with liberal arts faculty who were much more likely than other faculty to rate these competencies extremely important (see Tables C-4 and C-5). In addition, competency #22, language as reflective of culture, also varied with gender. Women tended to rate it higher than men.

Fine arts. An appreciation of the fine arts as a means of expression (item #17) was ranked third from the bottom of all the competencies by faculty overall as seen in Table 4-2. The degree of value placed on this competency was rated differently by faculty groups according to professional area and gender. Standardized residual analysis in Table C-6 indicates that major differences among professional groups occurred because agriculture and engineering faculty rated this competency slightly important (1) significantly more often than would be expected based on the ratings of the whole sample, and music and liberal arts faculty rating it extremely important (4) more often. Women rated it significantly higher than men. When grouped by professional rank, highest degree earned, and age, significant differences in the value placed on this competency were not evident.

Computer literacy. The importance placed on computer literacy (item #18) varied significantly when faculty were grouped by professional area but not by rank, highest degree earned, age, or gender (see item #18 in Table 4-1). As can be seen in Table C-7, music faculty were less likely to rate this competency extremely important than other groups. The total sample ranked this competency 25th of the 34 items, putting it in the bottom third in terms of importance.

Oral and written expression. The ability to express oneself orally and in writing (item #33) was the competency rated second highest by the total sample as can be seen in Table 4-2. Three faculty groups ranked it as the most important competency and all professional groups ranked it among the top four. Ninety-eight percent of the faculty rated this competency decidedly (3) or extremely (4) important. Chi-square analyses demonstrated no significant differences among groups of faculty on this competency except when they were grouped by gender. Women rated it significantly more important than men.

Reading critically and with understanding. This competency (item #23) was the most highly valued by all faculty. Table 4-2 indicates that it ranked in the top four in terms of importance placed on it by all professional groups except journalism, who ranked it sixth. When grouped by professional area and age, faculty differed in the degree of importance placed on this competency (see #23 in Table 4-1). The data in Table C-8 indicate that 97% of all faculty rated it 3 or 4. Because of the high ratings on this competency, the chi-square was not meaningful, as can be seen in Table C-8. It appears, however, that agriculture and engineering faculty rated this competency decidedly important (3), or lower, more than other groups who rated it extremely important (4) more often. Similarly, chi-square analysis of age differences was not meaningful because of the high proportion of cells with a minimum expected frequency of less than 5.

Resources and the Environment

Differences in the value placed on the competency suggesting concern for natural resources and the environment (item #27) varied significantly when faculty were grouped by professional area, rank, and gender (see #27 in Table 4-1). The most significant variations by professional area can be seen in Table C-9 and indicate that liberal arts faculty rated it extremely important (4) more often than the whole sample. Significant differences in grouping by faculty rank are caused by a few faculty in the instructor and assistant professor ranks (see Table C-10). Women rated this competency higher than men.

An understanding of the effects of science, technology, and natural resources on our lives (item #24) varied when faculty were grouped by professional area only (see #24 in Table 4-1). As can be seen in Table C-11, business, home economics, and music faculty rated this competency 1 and 2, or lower, than other groups, and nursing and pharmacy rated it 3 and 4, respectively, more often than others. Although agriculture faculty might be expected to rate this concept higher than other professional groups, differences were evident, but not extreme. The value placed on this concept was not significant when faculty were grouped by other variables.

Lifelong Learning

The concept related to lifelong learning was valued highly by all faculty in the sample. That a college graduate should know how to acquire knowledge and how to use it (item #28) was ranked as the fourth highest competency by the total sample (see Table 4-2). Significant variations in ratings occurred when faculty were grouped by professional area only (see #28 in Table 4-1 and Table C-12). Business faculty rated this competency decidedly important (3) more often than the sample as a whole. Others tended to rate it extremely important (4) more frequently.

A desire to learn and to grow (item #30) was ranked fifth overall by the sample (see Table 4-2). Data in Table C-13 indicate that 93% of the faculty rated it decidedly (3) or extremely (4) important. Significant differences occurred among faculty when they were grouped by professional area and gender. Analysis of these differences by professional area are found in appended Table C-13. Engineering faculty rated this competency decidedly important, or lower, more than others. Women rated it higher than men.

The competency suggesting that college graduates be aware of their limitations (#21) resulted in differences among faculty when grouped in every way except age (see #21 in Table 4-1). As seen in

Table C-14, nursing faculty tended to rate this competency extremely important (4) more often than would be expected when compared to the rest of the sample, and agriculture faculty rated it lower. Associate professors rated this competency slightly important (1) proportionately more often than professors and assistant professors (Table C-15); master's prepared faculty rated it higher than doctorally prepared faculty, and women rated it higher than men. One faculty person commented on the survey instrument that young people should not know their limitations, but should strive without constraint. Based on data from this study, there does not appear to be agreement by faculty on the importance of this competency.

Reasoning and Critical Thinking

The value placed on an understanding of the scientific method and how new knowledge is formed (competency #10) varied among faculty groups by professional area, rank, and highest degree earned, but not by age or gender (see #10 in Table 4-1). Business and music faculty rated it slightly important, or lower, more than other groups (Table C-16), and doctorally prepared faculty rated it higher than master's prepared faculty. Differences among the ranks occurred but no pattern is evident (Table C-17).

The ability to reason and analyze problems critically and logically (#25) was ranked third highest by all the faculty (see Table 4-2). There was no difference among ratings by faculty groups for this competency (see #25 in Table 4-1). Whether grouped by professional area, rank, highest degree earned, age, or gender, groups did not vary significantly in their opinions about this competency as an outcome of general education.

Citizenship

Responses to the competencies related to citizenship, governmental processes, group membership, and collaboration (items #3, #19, #20, and #29) indicate no pattern of response although there were significant differences among faculty groups for each of these four competencies (see #3, #19, #20, and #29 in Table 4-1). Each of these competencies was rated rather (2) or decidedly important (3) by well over half of the whole sample. None of them were ranked in the top 10 by the sample as a whole, and an understanding of group process and group membership was ranked 32 by the sample overall (see Table 4-2). Significant differences in groupings are scattered and demonstrate no pattern except that there was a tendency for women to rate all four of these competencies higher than men.

Values and Beliefs

Of the competencies addressing the area of values and beliefs (#2, #4, #7, #12, #13, #26, and #31), none ranked among the most important or the least important to the sample as a whole (see Table 4-2). When grouped by professional area, groups differed significantly in the degree of importance placed on all of these competencies except #13, distinguishing beliefs and facts. Standardized residual cross tabulations indicate that many of the differences occurred with agriculture and engineering faculty responding with lower ratings than others and with liberal arts faculty choosing higher ratings than others (see appended Tables C-18 through C-23). Women rated all of these competencies significantly higher than men with one exception. The exception was the item rating understanding of the distinction between beliefs and facts (#13) where men and women responded in a similar manner.

Opinions about whether general education should help a student to establish a provisional philosophy of life (item #32) varied when faculty were grouped in every way but rank. Music and education faculty rated it proportionately higher than the sample as a whole, and agriculture and engineering faculty rated it lower than the others (Table C-24). Women rated it higher than men; master's prepared faculty rated it higher than those with doctoral preparation; and younger faculty tended to rank it lower.

Times and Culture

Of the five competencies included in this group (#1, #5, #8, #14, and #15) none were ranked in the top 10 or bottom 5 by the faculty sample as a whole (see Table 4-2). Significant differences occurred among professional groups and gender for each of these competencies (see #1, #5, #8, #14, and #15 in Table 4-1). Standardized residual analyses of these data (Tables C-25 through C-29) indicate that agriculture and engineering faculty tended to choose the lower ratings of slightly important (1) and rather important (2) more often than other groups, and extremely important (4) less often. They were often joined by business and pharmacy faculty. Liberal arts faculty were more likely than others to rate these extremely important. In addition, understanding human motivation (#14) was rated more important by nursing and education faculty. Interpersonal relationships (#1) was rated extremely important more often by music and nursing faculty. Again agriculture and engineering faculty rated it extremely important less often than would be expected. Women rated all of these competencies higher than men, and master's prepared faculty rated item #14, understanding human motivation, higher than doctorally prepared faculty.

Interdependence

Competencies addressing the interdependence of the peoples of the world (#6, #11, and #34) were not among the most valued of the competencies by the sample as a whole (see Table 4-2). In fact, economic distribution of the world's resources (#34) was ranked among the lowest five. When grouped by professional area, faculty varied significantly in their opinions about all three of these competencies (see #6, #11, and #34 in Table 4-1). The data (see Tables C-30 through C-32) indicate that business faculty rated the two competencies on economic interdependence (#11 and #34) extremely important (4) more often than others and that liberal arts faculty joined them on the competency about distribution of the world's resources (#34). The impact of decisions on others (#6) was rated extremely important (4) less often by agriculture and engineering faculty and more often by liberal arts faculty than would be expected when compared to the responses of the entire sample. Professors rated economic interdependence (#11) extremely important (4) significantly more often than others (Table C-33). There were no differences in these competencies by age groups.

Clustering of the Faculty Groups

The third and final question addressed in this study was: How do faculty groups by professional orientation cluster together based on ratings of their opinions of the importance of general education competencies for undergraduate professional students? The question was posed to identify distinct clusters of faculty groups resulting from similarity of responses. Hierarchical cluster analysis using squared Euclidean distance means as the distance measure was utilized. Clustering was accomplished using the average between groups linkage method.

Choice of the variables used for cluster analysis is important because the chosen characteristics are the criteria for establishing the clusters. In this study, the mean of the responses of each professional group to each of the 34 dependent variables was used to determine the distance between the 10 cases or professional areas. In this study, the squared Euclidean distance was the index used to determine distance. Norusis (1988) defined the squared Euclidean distance as "the sum of the squared differences over all the variables" (p. B-72). The matrix in Table 4-3 illustrates the distances between all possible pairs of cases in the study.

The average linkage between groups method was used for deciding which cases or clusters would be combined at each step of the analysis. The average between groups linkage method is defined by Norusis (1988) as "the average of the distances between all pairs of cases in which one member of the pair is from each of the clusters" (p. B-83). Therefore the distance between two clusters is the average of the distances between all possible pairs of cases where one case is from one group and one case is from the other group. It, therefore, uses information about all pairs of distances.

Formation of the clusters is illustrated in Figure 4-1. The columns of Xs represent the cases being clustered. The figure is read from the bottom to the top. Because the agglomerative clustering method is used, each case or professional area, begins as a separate cluster. At the first step of the clustering, the two cases with the smallest squared Euclidean distance are combined. In this study, those cases are nursing and education faculty. At the second step

Table 4-3

Squared Euclidean Dissimilarity Coefficient Matrix

Square Euclidean measure used

Agglomeration method specified

Case	1	2	3	4
2	1.8905			
3	3.3196	1.5301		
4	.5588	2.4213	4.3013	
5	3.8123	1.9733	.6092	5.3491
6	4.6395	3.7680	4.2448	4.5380
7	6.7169	3.7824	2.6698	7.1359
8	4.2414	2.0828	.5503	5.4517
9	1.2568	1.4062	1.4342	1.7857
10	9.4906	5.5302	3.4484	10.3107

Case	5	6	7	8
6	5.8951			
7	2.5706	5.9983		
8	.8737	6.1244	3.2968	
9	2.0112	5.3126	4.4181	1.5988
10	3.7376	9.7491	3.2970	3.5174

Case	9
10	4.8491

Case #1: Agriculture
Case #2: Business
Case #3: Education
Case #4: Engineering
Case #5: Home Economics
Case #6: Journalism
Case #7: Music
Case #8: Nursing
Case #9: Pharmacy
Case #10: Liberal Arts

of the clustering, agriculture and engineering faculty are combined because the squared Euclidean distance value between these two cases is smaller than between any other two pairs or average of any clusters. At the third step, home economics clusters with nursing and education because the distance between home economics and the average of nursing and education is smaller than other distances or average of distances. The clustering continues, merging the two closest cases or groups until all cases form one cluster in the first row.

```
(Down) Number of Clusters   (Across) Case Label

    L M J H N E P B E A
    I U O O U D H U N G
    B S U M R U A S G R
      I R E S C R I I I
    A C N   I A M N N C
    R   A E N T A E E U
    T   L C G N C S E L
    S     O     Y S R T


1   XXXXXXXXXXXXXXXXXXX
2   XXX XXXXXXXXXXXXXXX
3   XXX X XXXXXXXXXXXXX
4   XXX X XXXXXXXXX XXX
5   X X X XXXXXXXXX XXX
6   X X X XXXXX XXX XXX
7   X X X XXXXX X X XXX
8   X X X X XXX X X XXX
9   X X X X XXX X X X X
```

Figure 4-1. Vertical icicle plot using average linkage (between groups)

Further inspection of the hierarchical cluster analysis shows that music and liberal arts faculty are dissimilar from the rest of the groups, but have some properties in common, and therefore cluster together at step four of the analysis. Journalism faculty in this study are dissimilar from all other groups. This case remains isolated from the rest of the cases until step two.

To summarize, the hierarchical cluster analysis was employed to define distinct clusters of faculty groups based on the similarity of distance means. The icicle plot is presented to provide a visual display of the clustering.

Summary

In this chapter, a description of the analysis for the three study questions was presented. Chi-square analyses indicate that significant differences of opinion about the importance of general education competencies for undergraduate professional students occurred frequently when faculty were grouped by professional area and gender. For most items, differences of opinion did not occur when faculty were grouped by rank, highest degree earned, and age. Rank ordering of the competencies revealed strong agreement about those competencies viewed as most important to the 10 groups of faculty. That is, faculty agree that students should know how to read and express themselves, learn how to reason and analyze, and have a desire and ability to learn and to acquire knowledge. Cluster analysis grouped faculty into distinct groups based on similarity. Nursing and education faculty formed one group which later in analysis is clustered with home economics, business, and pharmacy faculty. Agriculture and engineering faculty form one group. Liberal arts and music faculty form another group, but not until late in the analysis. Journalism remains alone in its own cluster until very late in the analysis because it is dissimilar from other faculty groups.

CHAPTER 5
CONCLUSIONS, DISCUSSION, IMPLICATIONS

This study was designed to determine if the importance placed on specific outcomes of general education for undergraduate students varied among groups of faculty. A nationwide survey of professional and liberal arts faculty was conducted to assess the opinions of faculty members about the relative importance they place on general education outcomes for undergraduate professional students. The data were analyzed to compare and cluster faculty groups as well as to identify most important and least important competencies. Comparison of the degree of importance of opinions of faculty grouped by various dependent variables was made. Ranking of the competencies was also accomplished. An assumption of the study, grounded in the literature, was that certain competencies are expected of professional students as a result of study in baccalaureate programs.

Conclusions

Major conclusions resulting from this research are summarized below:

1. Faculty groups differed significantly in the degree of importance they placed on most of the general education competencies when grouped by professional area and gender but not when they were

grouped by rank, highest degree earned, or age. When grouped by professional area, testing by the chi-square statistic demonstrated significant associations ($p<.05$) with all except three of the competencies. Two of these competencies, the ability to reason and analyze problems critically and logically, and effective oral and written expression, were ranked first and second in importance by the sample as a whole. When grouped by gender, women rated 24 of the 34 competencies significantly more important than men. Men rated only one competency more important than women. They placed more importance on understanding the basic concepts of numbers and quantity. When grouped by rank, highest degree earned, and age, the opinions of the groups varied infrequently.

2. Rank ordering of the competencies demonstrated that faculty were consistent in their opinions about the most important of the competencies. The same five competencies were ranked as the most important by all 10 faculty groups with three exceptions. The five most important competencies were the ability to read, to express oneself orally and in writing, to reason and analyze problems to know how to acquire knowledge and how to use it, and the desire to learn and grow. The exceptions were with nursing and journalism faculty who each ranked one of these competencies sixth, and with music faculty who ranked one of them ninth. Consensus by the 10 groups about the least important of the competencies for undergraduate education was

not as clear. Of the five competencies ranked lowest by the entire sample, four of them refer explicitly or implicitly to other cultures or other countries. Based on the data from this study, faculty in land-grant institutions view understanding of global interconnectedness to be the least important of generally accepted outcomes of general education.

3. When grouped by professional area, faculty groups clustered into several distinct groups based on similarity of opinions of the importance of the various general education competencies. Nursing and education faculty formed one group which later in analysis expanded to include home economics faculty, business faculty, and pharmacy faculty. Agriculture and engineering faculty formed another cluster. Liberal arts and music faculty formed another, and journalism faculty stood alone until late in cluster analysis as dissimilar from other groups. Of all the pairs of professional groups, the nursing and education faculty were computed to have the smallest dissimilarity coefficient (see Table 4-3) and therefore share the most similar opinions of any two groups in the study about the importance of the general education competencies.

Discussion

Demographic Data

There were no surprises in the demographic data. As would be expected, this study demonstrated that faculty rank tends to increase with education and with age. The increase in women in the lower age groups indicates that more women are entering academe and they are doing so early in their careers. Women, however, have less education, lower rank, and are younger than their male counterparts in the university. Not surprisingly, they are also much more likely to teach nursing or home economics.

Further discussion of results must necessarily be carefully weighted by the fact that the population of home economics, journalism, and pharmacy faculty was underrepresented in this sample. To assure sound statistical procedures, the small journalism sample was omitted from the data analysis for the first study question.

Professional Orientation

Similarities and differences of opinion among faculty, when grouped by professional orientation, were evident from data analysis in this study. Agriculture and engineering faculty rated many of the competencies lower than other groups. These two faculty groups clustered together in hierarchical analysis. They also responded in very similar ways to many of the competencies on the survey. They placed less importance than others on the fine arts, reading, values and beliefs, times and culture, and the impact of decisions on others. They placed more importance on the effects of science and technology and on the concepts of numbers and quantity than other groups. Data in this study indicated that these groups appear to hold less favor for general education skills than the other groups as evidenced by the low mean values for many of the competencies (see Appendix). The earlier studies by Dressel, Mayhew, and McGrath (1959) and Lyons (1978) also found agriculture and engineering faculty to hold less favor for liberal arts than others.

Journalism faculty in this study, while underrepresented, clearly expressed a view of general education which varies from other groups. They rated many of the competencies lower than other groups (see Appendix). In addition, this group stands alone in hierarchical analysis as different from the other professional groups. This small sample does not support the view held by journalism faculty in the earlier studies by Dressel, Mayhew, and McGrath (1959) and Lyons (1978) in which journalism faculty stated a high regard for the liberal arts.

Nursing faculty, educators, and home economics faculty were grouped together in cluster analysis because of the small squared Euclidean dissimilarity coefficient between each of these pairs. These groups are composed of a higher percentage of women than other professional groups in the population. As evidenced by results of the cluster analysis, nursing and education faculty were the two groups that held the most similar views about the importance of general education competencies in the education of professional baccalaureate students.

While music faculty are grouped with liberal arts faculty in the cluster analysis, the two groups report clearly differing degrees in the importance they place on many of the competencies. The earlier studies by Dressel, Mayhew, and McGrath (1959) and Lyons (1978) found nursing and journalism faculty most highly favorable of the liberal arts of all the professional faculty. This study found nursing and home economics faculty to rate more of the general education competencies higher than the other faculty groups (but not as many as liberal arts faculty).

The Most Important Competencies

In this study, data clearly indicate consensus among various faculty groups about the most important general education competencies expected of undergraduate education. All faculty groups ranked the same five competencies as the most important with three exceptions. The exceptions were that journalism faculty ranked reading critically and with understanding sixth; nursing faculty ranked a desire to learn and grow sixth; and music faculty ranked the ability to reason and analyze problems critically and logically ninth. The five most important competencies will be reviewed individually.

Ability to read critically and with understanding. This competency was ranked first by the sample as a whole as the most important of the general education competencies on the survey. It is clear that faculty view the ability to read, and to make meaning of one's reading, as very important for college students. This competence is discussed very little in the literature. The earlier studies by Dressel, Mayhew, and McGrath (1959) and Lyons (1978), evaluated general education relative to specific course offerings rather than by abilities or outcomes. In those studies, researchers did not investigate opinions about reading courses, presumably because reading is not usually a college level offering.

The literature seems to make a basic assumption that students have the ability to read comprehensively prior to enrollment in college courses or programs of study. It is very likely that most college teachers expect their students to bring this skill with them upon entry into college. However, it is also true that a significant number of colleges today offer remediation in basic skills, including reading, and that a significant number of students are enrolled in them.

While the purpose of this research was not to address when or where or to what degree competence in reading should be achieved, respondents expressed strong opinions about the importance of reading competence for undergraduates. This finding has not been previously reported. Whether this finding reflects observed weaknesses of college students today, or is an outcome long expected of undergraduate study is not clear.

Competence in oral and written expression. The faculty in this study agreed that the ability to speak and write effectively should receive very high priority in the educational process. This finding reflects the Dressel, Mayhew, and McGrath (1959) and Lyons (1978) studies in which faculty agreed virtually unanimously that English composition should be required of all students (rather than encouraged or discouraged, or be offered as an option).

The ability to express oneself in an effective, orderly manner was supported by all six of the general education authorities upon which the present study was based. For instance, Boyer and Levine (1981) view communication as the basis of human interaction, a media which helps to define oneself and which binds people together. And the Red Book report (Harvard, 1945) suggests that effective communication enhances one's ability to think. The indication by these authorities is that skill in communication has implications reaching beyond the ability to communicate one's thoughts and ideas.

The recent reports on secondary and postsecondary education (Bennett, 1984; Boyer, 1987; _Integrity_, 1985; _Involvement_, 1984) have identified serious weaknesses in the verbal abilities of American students. And Boyer (1987) reiterates the continued frustration of college teachers over the inability of students to express themselves. Again, many colleges already provide opportunities for remediation in writing skills which are designed to enhance students' capacities to do college work. As a part of a college visit series, a revealing observation was reported by Boyer in his recent publication, _College:_

The Undergraduate Experience in America (1987). One investigator discovered that three-quarters of the senior students in a private American university believed they could graduate from the institution without ever speaking in class. Not surprisingly, college faculty in this study expressed strong opinions about student competencies in communication.

Ability to reason and analyze problems critically and logically. Competence in the ability to solve problems was viewed by faculty in this study as the third most important skill for college students. The importance placed on the ability to problem solve was supported by all of the six authorities upon which this study was based (Boyer & Levine, 1981; Dressel, 1979; Harvard, 1945, 1978; McGrath, 1959; Pillepich, 1962). For instance, McGrath (1959) believed that citizens must "think logically and clearly [in order to solve the] complicated problems of their time" (p. 20). In his cogent discussion of the topic, McGrath suggested that all subject areas should stretch the abilities of students in order to promote the development of intellectual capabilities and problem solving skills. He strongly implied that teaching problem solving is the responsibility of all teachers in all content areas.

Lifelong learning. The competencies rated fourth and fifth in importance by the faculty sample in this study were concerned with lifelong learning. These two competencies are to know how to acquire knowledge and how to use it, and the desire to learn and grow. Once again, faculty have expressed that a great deal of importance should be placed on a concept which is not associated with a particular course or knowledge area, and cannot be assumed to be the responsibility of a specific academic department or college.

The idea that knowledge changes so rapidly that much of one's education is out of date before graduation is more true today than ever before. For professionals, in particular, the defined body of knowledge necessary to practice in one's field changes daily. New technologies continually reshape perceptions and perceived truths. One's responsibility as a professional cannot be fulfilled without the ongoing effort of learning new facts and new ideas.

McGrath (1959) believed a college graduate should be "driven by an unrelenting curiosity [and] and irresistible desire to learn and to know" (p. 25). Dressel (1979) linked continual learning to one's obligation as a responsible citizen, believing that wise civic decisions cannot be made unless one's perceptions are current. Today, more than ever, the turnover of knowledge and complexity of technology make continual learning essential for all professionals and responsible citizens.

The Least Important Competencies

Consensus about the least important of the competencies rated by faculty in this study was not as clear as those rated as the most important. The total sample rated the following five competencies as the least important for undergraduate education. Each of these five competencies was rated near the bottom of each of the ranking lists by most of the professional and liberal arts groups. A discussion of them will follow.

Distribution of the world's resources. The competency ranked 30th of the 34 items by the total sample in this study was an awareness of the economic forces which influence distribution of the world's resources. This idea refers to the interdependence of the world's people, and as with four of the five lowest ranked competencies, it relates to the interconnectedness of the peoples of the world.

Group membership and formal association. Faculty in this sample ranked understanding of the process of group membership and the significance of formal associations in our lives as 31st of the 34 competencies listed. This goal of education is grounded in the fact that most of our day to day existence occurs in association with others in formal or informal groups. An ability to understand and work effectively in groups, therefore, is essential to one's role as an effective human being. This competency or goal of education was strongly supported by Boyer and Levine (1981) and Dressel (1979).

The low ranking of this competency may be because it is not viewed as a competence which can or should be taught. It may be that the statement on the survey instrument (item #20) was not clear to respondents. It may be because it truly was not viewed by this sample as an outcome of education which is as important as the others.

Appreciation of the fine arts. In this study, an appreciation of the fine arts ranked 32nd of the 34 competencies in importance for undergraduate professional education by the faculty overall. All groups except music and liberal arts faculty ranked it on or near the bottom. Earlier studies (Dressel, Mayhew, & McGrath, 1959; Lyons, 1978) indicated that most faculty supported music and art as optional subjects (not required but not discouraged). Predictably, music faculty was the outstanding exception then as now. And as with earlier studies, there was a tendency for faculty to indicate value for a subject which supports professional study in their own field.

Art and music as forms of expression are symbols of cultural heritage and ideologies. They communicate definition for individuals and groups. It is congruous with the previous rankings that this competence was ranked low by this faculty sample.

Language as reflective of cultural values and traditions. Understanding of how cultural values are reflected through language ranked next to the bottom of the ranking sequence by the sample as a whole in this study and fell near the bottom of the ranking sequence for each of the professional groups. While this competence can refer to an appreciation of the structure and usage of other languages, it also implies an understanding of how languages evolve and how subtle verbal and nonverbal expression can reflect the values and traditions of a heritage. Boyer and Levine (1981) called language "the glue of our social existence" (p. 37). In binding us together, language also serves to define individuals as unique and different from others. Understanding of the strength and character of language symbols was not viewed as important as other abilities by this faculty sample.

Exposure to a foreign language. This competency was ranked 34th, or least important of all the competencies, by the total faculty sample in this study. Music and liberal arts faculty did not rank it as low as others. Earlier studies found that faculty did not place as much priority on foreign languages as on most other subjects (Dressel, Mayhew, & McGrath, 1959; Lyons, 1978).

Numbers and Quantity

In this study, there was not agreement by faculty about the importance of a basic understanding of the concepts of numbers and quantity by students. It ranked 14th of the 34 competencies by the respondents overall in this study and therefore was not near the top or the bottom of the list. It was ranked as more important in the professional areas of agriculture, business, engineering, and pharmacy. The Lyons study (1978) supported these findings, but indicated that education and home economics faculty also valued math skills enough to prefer that a math course be required of students rather than be optional. As with earlier studies, there is a tendency for this competency to be valued more highly by faculty in areas where math supports professional study. And, as with earlier studies, music faculty rated numbers skills low. Of interest is the fact that medieval universities placed enough importance on this area of learning to devote two of the seven liberal studies to numbers and quantity. Clearly, differences exist among faculty about the importance of this competency. Dialog in curricular discussions about this skill could be lively.

Summary of the Ranking

Faculty in this sample ranked five competencies as the most important for undergraduate education with very little disagreement. Those competencies are:

1. The ability to read critically and with understanding,
2. The ability to express thoughts and ideas in oral and written form clearly and effectively,
3. The ability to reason and analyze problems critically and logically,
4. A knowledge of how to acquire knowledge and how to use it, and
5. A desire to learn and grow.

Four of these five competencies cannot be identified with specific course offerings as instructional units are currently developed and offered in most institutions. If faculties really expect undergraduate students to have these skills upon graduation, general education programs will need to be rethought and restructured, and instructional processes reevaluated.

The five competencies ranked lowest by the faculty in this study were:

30. An awareness of the economic forces which influence distribution of the world's resources;
31. An understanding of the process of group membership, the significance of formal associations in our lives, and the rewards, obligations, and risks of formal institutions;
32. An appreciation of the fine arts as forms of expression;
33. An understanding of the significance of language as reflective of cultural values and traditions; and
34. Some exposure to a foreign language.

Four of these five lowest ranked competencies relate to the interconnectedness of the peoples of the world. As a nation, Americans profess a high regard for positive international relations, yet the overwhelming majority of Americans have had no exposure to a foreign language, much less the ability to communicate in even the simplest form in another's language. Geographic separation has only served to support this isolation. Within our own boundaries, Americans have failed to assimilate well with many of the immigrant groups, or even with native Americans. It appears that faculty in this sample reflect societal values about global relationships. As international trade, business, travel, and communication become more and more commonplace, the value placed on the ability of Americans to interface effectively with other peoples in other cultures may compel rethinking.

Implications

Results of this study indicate that college faculty agree about the most important outcomes of general education for undergraduate professional students. They believe that students should be able to read with understanding, express themselves clearly orally and in writing, problem solve, know how to acquire knowledge and how to use it, and value lifelong learning. Since undergraduate curricula today do not usually address four of these five competencies, results of this investigation suggest a new approach to viewing general education curricular issues. Not only can these data be used for rethinking curricula, they might also influence teaching strategies or be used to develop new ways of organizing knowledge and new ways of thinking about general education.

Since development of a general education program is an institutional matter, data from this study could pose a starting place for campus discussion about general education studies. Much of the previous research in the area of general education has been based on credit hours, departmental issues, and special interests and has, therefore, been enmeshed in controversy. With areas of potential agreement and difference already identified, collaboration among faculty from various professional schools who have never met is possible.

As educational costs rise and student bodies become more diverse, institutions need new strategies on which to base programs and allocate resources. A new way of thinking about expectations of general education programs could provide a unique basis for meaningful curricular examination within institutions.

Recommendations for Further Study

As a contribution to the growing body of knowledge about general education for undergraduate students, recommendations for further study are made. First, replication of this study should be made using faculty samples from different types of institutions. Replication should involve a sample with a full component of faculty from every professional area. Secondly, similar comparisons with faculty groups from professional areas not studied here should be made. Third, further study should also include departmental and institutional administrators. Comparisons could then be made with faculty groups. Fourth, the survey instrument might be utilized in institutional research as a first step in campus dialog over review of general education studies. Fifth, the instrument in a revised version could be used for pretesting and posttesting of a student population for purposes of evaluating the effectiveness of a general education program. Sixth, comparisons of groups on a geographic basis could be made to determine if groups of interest in different parts of the country professed to hold the same priorities for general education outcomes. Lastly, further refinement of the survey instrument to more closely reflect weighting of areas of priority is recommended.

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APPENDIX A
SURVEY INSTRUMENT AND MAILINGS

SURVEY INSTRUMENT
GENERAL EDUCATION COMPETENCIES FOR PROFESSIONAL STUDENTS

Your rank:

Professor ( ) Associate Professor ( )
Assistant Professor ( ) Instructor ( )

Highest degree earned:

doctorate ( ) master's ( ) Other ________________

Your age:

under 35 ( ) 35-45 ( ) 46-55 ( ) over 55 ( )

Your gender:

male ( ) female ( )

I would like a copy of the results of this research.

yes ( ) no ( )

Please react to each statement by marking the desired space:

1 = slightly important
2 = rather important
3 = decidedly important
4 = extremely important

A college graduate should:	1	2	3	4
1. have some understanding of the complexity of human interaction and some skill in the art of human association.	( )	( )	( )	( )
2. respect the differing beliefs, values, and views of others.	( )	( )	( )	( )
3. be informed and concerned about civic matters.	( )	( )	( )	( )
4. have the ability to examine his or her own values and beliefs.	( )	( )	( )	( )

1 = slightly important
2 = rather important
3 = decidedly important
4 = extremely important

A college graduate should:	1	2	3	4
5. have some understanding of the similarities and differences among the peoples of the world.	( )	( )	( )	( )
6. be aware that the decisions of individuals and societies may impact on others.	( )	( )	( )	( )
7. understand how values are formed, changed, and passed on to others.	( )	( )	( )	( )
8. have some knowledge of another culture and how it compares to one's own.	( )	( )	( )	( )
9. have an understanding of the basic concepts of numbers and quantity and have skill in their use.	( )	( )	( )	( )
10. understand scientific methodology and how new knowledge is formed.	( )	( )	( )	( )
11. recognize the economic interdependence of the peoples of the world.	( )	( )	( )	( )
12. understand how society responds to unpopular or contrasting beliefs and values.	( )	( )	( )	( )
13. understand the distinctions between beliefs and facts.	( )	( )	( )	( )
14. have some understanding of human motivation and how it affects behavior.	( )	( )	( )	( )
15. understand how the past has shaped the present and how today's world and decisions might influence the future.	( )	( )	( )	( )
16. have had some exposure to a foreign language.	( )	( )	( )	( )

1 = slightly important
2 = rather important
3 = decidedly important
4 = extremely important

A college graduate should:	1	2	3	4
17. have an appreciation of the fine arts as a form of expression.	( )	( )	( )	( )
18. be literate in basic computer skills.	( )	( )	( )	( )
19. be motivated to cooperate and collaborate with others in analyzing problems, seeking solutions, and taking action on them.	( )	( )	( )	( )
20. have an understanding of the process of group membership, the significance of formal associations in our lives, and the rewards, obligations, and risks of formal institutions.	( )	( )	( )	( )
21. be aware of his or her own limitations.	( )	( )	( )	( )
22. understand the significance of language as reflective of cultural values and traditions.	( )	( )	( )	( )
23. be able to read critically and with understanding.	( )	( )	( )	( )
24. have some understanding of and concern for the power of science, technology, and natural forces to benefit and complicate our lives.	( )	( )	( )	( )
25. be able to reason and analyze problems critically and logically.	( )	( )	( )	( )
26. have some understanding of the influence of religious, social, and political ideologies.	( )	( )	( )	( )
27. be aware of and concerned about the impact of the world's population on natural resources and the environment.	( )	( )	( )	( )

1 = slightly important
2 = rather important
3 = decidedly important
4 = extremely important

A college graduate should:	1	2	3	4
28. know how to acquire knowledge and how to use it.	( )	( )	( )	( )
29. have an understanding of governmental processes (federal, state, and local).	( )	( )	( )	( )
30. have a desire to learn and grow.	( )	( )	( )	( )
31. have some understanding of and experience in thinking about moral and ethnical problems.	( )	( )	( )	( )
32. have at least a provisional philosophy of life.	( )	( )	( )	( )
33. be able to express thoughts and ideas in oral and written form clearly and effectively.	( )	( )	( )	( )
34. be aware of the economic forces which influence distribution of the world's resources.	( )	( )	( )	( )

Are there other competencies you would like to include:

Please include any comments you wish to make:

COVER LETTER

Dear Professor:

The general education component of the undergraduate curriculum has been discussed and criticized repeatedly in higher education. General education is the required core of studies, largely in the liberal arts, necessary for graduation from baccalaureate programs. My special interest is the general education concerns of faculty for professional students, and therefore I have undertaken to investigate this curricular area for my doctoral research. I hope that you will be willing to assist me with this endeavor by agreeing to complete the enclosed survey questionnaire concerning your expectations of general education.

The study is designed to determine the desired outcomes of general education for professional students (such as business or music) by professional and liberal arts faculty. That is, what characteristics or competencies would you like to see exhibited by your students upon graduation from a professional baccalaureate program which would be gained from general education? Please complete the survey even if you teach only graduate students.

Your name was randomly selected from your institutional catalog. All data obtained in this research will be used anonymously. The number on the questionnaire will be used only for purposes of follow-up on nonrespondents. The data will not be matched in any way to you nor will your identity (individual or institutional) be revealed in reporting the research. Your return of the questionnaire constitutes your agreement to participate in the study.

The accompanying survey will take less than five minutes to complete. A stamped envelope is enclosed. If you wish a copy of the results of this research, please so indicate on the survey form.

Thank you for your help.

Sincerely,

Judith W. Gross
Ph.D. Candidate

POSTCARD FOLLOW-UP

Exactly what is it we want our students to gain from college (besides employment)? While the gains of a liberal education are widely debated, college faculty have had amazingly little input in the question. It may not shake the earth, but I think our opinions about what "the educated person" should be are worthwhile and valuable.

You sure would help me by completing the survey I sent to you a few weeks ago about general education--and ultimately you might contribute to the academic experience.

If by some remote chance you still have the questionnaire, please consider filling it out. If not, please consider responding to the next form which I will mail to you in a couple of weeks.

Thanks much.

Judith W. Gross

ATTENTION GETTING LETTER (THIRD MAILING)

"These findings are not statistically valid."

I would not like to be the subject of this critique and am therefore soliciting your help in reducing the nonresponse rate in my study. According to Fox (1969), "there is extensive evidence in the literature that whether comparable on selection characteristics or not, nonresponders generally hold different opinions than responders" (p. 345).

You are a nonresponder. I need you. Well, maybe not literally, but I sure would like your response to my survey (enclosed).

Many thanks.

FINAL FOLLOW-UP MAILING

Dear Professor:

Several weeks ago I mailed a follow-up questionnaire to you and I am again seeking your help with my project. This nationwide study is designed to establish the importance of various outcomes of general education for undergraduate students in professional programs by professional and liberal arts faculty. The general education component of the undergraduate curriculum has been discussed and criticized repeatedly in higher education. While a great deal has been written concerning outcomes of general education, the importance of various outcomes to diverse groups has never been documented.

Results of this study will identify areas of agreement and disagreement among faculty groups. They should be of value in addressing educational needs of a diverse student body.

Your institution and name were chosen randomly as part of a nationwide sample. All responses will be kept confidential. If you would like a summary of the results of this project, please so indicate on the questionnaire form. If you have returned a previous mailing, please disregard this appeal.

Please take a few minutes of your time to respond to this inquiry. It really won't take very long. Thank you for your cooperation.

Sincerely,

Judith W. Gross
Ph.D. Candidate

APPENDIX B
DEMOGRAPHIC CROSS TABULATIONS

Table B-1

Standardized Residual Cross Tabulations: Professional Area by Highest Degree Earned

Degree - >	Count Row Pct Col Pct Tot Pct Std Res	Doctor 1	Master's 2	Other 3	Row Total
PROF AREA					
	1	75	20	1	96
AGRICULT		78.1%	20.8%	1.0%	15.5%
		15.5%	15.7%	10.0%	
		12.1%	3.2%	.2%	
		.0	.1	-.4	
	2	56	1	2	59
BUSINESS		94.9%	1.7%	3.4%	9.5%
		11.6%	.8%	20.0%	
		9.0%	.2%	.3%	
		1.5	-3.2	1.1	
	3	65	11	2	78
EDUCATION		83.3%	14.1%	1.6%	12.6%
		13.5%	8.7%	20.0%	
		10.5%	1.8%	.3%	
		.5	-1.2	.7	
	4	74	2	0	76
ENGINEER		97.4%	2.6%	0.0%	12.3%
		15.3%	1.6%	0.0%	
		11.9%	.3%	0.0%	
		1.9	-3.4	-1.1	
	5	21	15	1	37
HOME ECON		56.8%	40.5%	2.7%	
		4.3%	11.8%	10.0%	
		3.4%	2.4%	.2%	
		-1.5	2.7	.5	
	6	7	6	1	14
JOURNAL		50.0%	42.9%	7.1%	2.3%
		1.4%	4.7%	10.0%	
		1.1%	1.0%	.2%	
		-1.2	1.8	1.6	

Table B-1--Continued

Degree - >	Count Row Pct Col Pct Tot Pct Std Res	Doctor 1	Master's 2	Other 3	Row Total
PROF AREA					
	7	36	25	2	63
MUSIC		57.1%	39.7%	3.2%	10.2%
		7.5%	19.7%	20.0%	
		5.8%	4.0%	.3%	
		-1.9	3.4	1.0	
	8	30	41	0	71
NURSING		42.3%	57.7%	0.0%	11.5%
		6.2%	32.3%	0.0%	
		4.8%	6.6%	0.0%	
		-3.4	6.9	-1.1	
	9	49	1	1	51
PHARMACY		96.1%	2.0%	2.0%	8.2%
		10.1%	.8%	10.0%	
		7.9%	.2%	.2%	
		1.5	-2.9	.2	
	10	70	5	0	75
LIB ARTS		93.3%	6.7%	0.0%	12.1%
		14.5%	3.9%	0.0%	
		11.3%	.8%	0.0%	
		1.5	-2.6	-1.1	
	Column Total	483 77.9%	127 20.5%	10 1.6%	620 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
147.74828	18	.0000	.226	11 of 30 (36.7%)

Number of Missing Observations = 0

Table B-2

Standardized Residual Cross Tabulations: Professional Area by Rank

Rank ->	Count Row Pct Col Pct Tot Pct Std Res	PROFESSR 1	ASSCPROF 2	ASSTPROF 3	INSTRCTR 4	Row Total
PROF AREA						
AGRICULT	1	43 44.8% 16.2% 7.0% .2	32 33.3% 16.0% 5.2% .1	19 19.8% 15.4% 3.1% -.0	2 2.1% 7.4% .3% -1.1	96 15.6%
BUSINESS	2	28 48.3% 10.5% 4.5% .6	15 25.9% 7.5% 2.4% -.9	14 24.1% 11.4% 2.3% .7	1 1.7% 3.7% .2% 1.0	58 9.4%
EDUCATION	3	33 42.9% 12.4% 5.4% -.0	27 35.1% 13.5% 4.4% .4	10 13.0% 8.1% 1.6% -1.4	7 9.1% 25.9% 1.1% 2.0	77 12.5%
ENGINEER	4	55 73.3% 20.7% 8.9% 4.0	15 20.0% 7.5% 2.4% -1.9	5 6.7% 4.1% .8% -2.6	0 0.0% 0.0% 0.0% -1.8	75 12.2%
HOME ECON	5	5 13.5% 1.9% .8% -2.7	10 27.0% 5.0% 1.6% -.6	15 40.5% 12.2% 2.4% 2.8	7 18.9% 25.9% 1.1% 4.2	37 6.0%
JOURNAL	6	3 23.1% 1.1% .5% -1.1	6 46.2% 3.0% 1.0% .9	3 23.1% 2.4% .5% .3	1 7.7% 3.7% .2% .6	13

Table B-2--Continued

Rank ->	Count Row Pct Col Pct Tot Pct Std Res	PROFESSR 1	ASSCPROF 2	ASSTPROF 3	INSTRCTR 4	Row Total
PROF AREA MUSIC	7	22 34.9% 8.3% 3.6% -1.0	34 54.0% 17.0% 5.5% 3.0	5 7.9% 4.1% .8% -2.1	2 3.2% 7.4% .3% -.5	63 10.2%
NURSING	8	7 9.9% 2.6% 1.1% -4.3	22 31.0% 11.0% 3.6% -.2	37 52.1% 30.1% 6.0% 6.1	5 7.0% 18.5% .8% 1.1	71 11.5%
PHARMACY	9	31 60.8% 11.7% 5.0% 1.9	15 29.4% 7.5% 2.4% -.4	4 7.8% 3.3% .6% -1.9	1 2.0% 3.7% .2% -.8	51 8.3%
LIB ARTS	10	39 52.0% 14.7% 6.3% 1.2	24 32.0% 12.0% 3.9% -.1	11 14.7% 8.9% 1.8% -1.0	1 1.3% 3.7% .2% -1.3	75 12.2%
	Column Total	266 43.2%	200 32.5%	123 20.0%	27 4.4%	616 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
158.15008	27	.0000	.570	12 of 40 (30.0%)

Number of Missing Observations = 4

Table B-3

Standardized Residual Cross Tabulations: Professional Area by Gender

Gender - >	Count Row Pct Col Pct Tot Pct Std Res	Male 1	Female 2	Row Total
PROF AREA				
AGRICULT	1	91 95.8% 20.4% 14.7% 2.7	4 4.2% 2.3% .6% -4.3	95 15.4%
BUSINESS	2	51 86.4% 11.4% 8.3% 1.3	8 13.6% 4.7% 1.3% -2.1	59 9.5%
EDUCATION	3	56 72.7% 12.5% 9.1% .0	21 27.3% 12.3% 3.4% -.1	77 12.5%
ENGINEER	4	73 96.1% 16.3% 11.8% 2.4	3 3.9% 1.8% .5% -3.9	76 12.3%
HOME ECON	5	8 21.6% 1.8% 1.3% -3.6	29 78.4% 17.0% 4.7% 5.9	37 6.0%
JOURNAL	6	11 78.6% 2.5% 1.8% .3	3 21.4% 1.8% .5% -.4	14 2.3%

Table B-3—Continued

Gender - >	Count Row Pct Col Pct Tot Pct Std Res	Male 1	Female 2	Row Total
PROF AREA				
MUSIC	7	50 79.4% 11.2% 8.1% .7	13 20.6% 7.6% 2.1% -1.1	63 10.2%
NURSING	8	4 5.6% .9% .6% -6.6	67 94.4% 39.2% 10.8% 10.7	71 11.5%
PHARMACY	9	47 92.2% 10.5% 7.6% 1.7	4 7.8% 2.3% .6% -2.7	51 8.3%
LIB ARTS	10	56 74.7% 12.5% 9.1% .2	19 25.3% 11.1% 3.1% -.4	75 12.1%
	Column Total	447 72.3%	171 27.7%	618 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
270.76928	9	.0000	3.874	1 of 20 (5.0%)

Number of Missing Observations = 2

Table B-4

Standardized Residual Cross Tabulations: Rank by Highest Degree Earned

Degree - >	Count Row Pct Col Pct Tot Pct Std Res	Doctor 1	Master's 2	Other 3	Row Total
RANK					
PROFESSOR	1	244 91.7% 50.9% 39.6% 2.6	20 7.5% 15.7% 3.2% -4.7	2 .8% 20.0% .3% -1.1	266 43.2%
ASSCPROF	2	168 84.0% 35.1% 27.3% 1.0	31 15.5% 24.4% 5.0% -1.6	1 .5% 10.0% .2% -1.2	200 32.5%
ASSTPROF	3	67 54.5% 14.0% 10.9% -2.9	53 43.1% 41.7% 8.6% 5.5	3 2.4% 30.0% .5% .7	123 20.0%
INSTRUCTR	4	0 0.0% 0.0% 0.0% -4.6	23 85.2% 18.1% 3.7% 7.4	4 14.8% 40.0% .6% 5.4	27 4.4%
Column Total		479 77.8%	127 20.6%	10 1.6%	616 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
178.89852	6	.0000	.438	4 of 12 (33.3%)

Number of Missing Observations = 4

Table B-5

Standardized Residual Cross Tabulations: Highest Degree Earned by Age

AGE - >	Count Row Pct Col Pct Tot Pct Std Res	< 35 1	35–45 2	46–55 3	> 55 4	Row Total
DEGREE						
DOCTOR	1	31 6.4% 59.6% 5.0% -1.5	190 39.4% 76.6% 30.7% -.2	154 32.0% 85.1% 24.9% 1.1	107 22.2% 78.1% 17.3% .0	482 78.0%
MASTER'S	2	17 13.5% 32.7% 2.8% 2.0	54 42.9% 21.8% 8.7% .5	27 21.4% 14.9% 4.4% -1.6	28 22.2% 20.4% 4.5% .0	126 20.4%
OTHER	3	4 40.0% 7.7% .6% 3.4	4 40.0% 1.6% .6% -.0	0 0.0% 0.0% 0.0% -1.7	2 20.0% 1.5% .3% -.1	10 1.6%
Column Total		52 8.4%	248 40.1%	181 29.3%	137 22.2%	618 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
25.03826	6	.0003	.841	4 OF 12 (33.3%)

Number of Missing Observations = 2

Table B-6

Standardized Residual Cross Tabulations: Highest Degree Earned by Gender

GENDER - >	Count Row Pct Col Pct Tot Pct Std Res	Male 1	Female 2	Row Total
DEGREE				
DOCTOR	1	368 80.3% 86.8% 62.8% 2.1	95 19.7% 55.6% 15.4% -3.3	483 78.2%
MASTER'S	2	52 41.6% 11.6% 8.4% -4.0	73 58.4% 42.7% 11.8% 6.5	125 20.2%
OTHER	3	7 70.0% 1.6% 1.1% -.1	3 30.0% 1.8% .5% .1	10 1.6%
Column Total		447 72.3%	171 27.7%	618 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
74.45794	2	.0000	2.767	1 OF 6 (16.7%)

Number of Missing Observations = 2

Table B-7

Standardized Residual Cross Tabulations: Rank by Age

AGE ->	Count Row Pct Col Pct Tot Pct Std Res	< 35 1	35-45 2	46-55 3	> 55 4	Row Total
RANK						
PROFESSOR	1	1 .4% 1.9% .2% -4.5	50 18.8% 20.4% 8.1% -5.4	108 40.6% 59.7% 17.6% 3.4	107 40.2% 78.1% 17.4% 6.2	266 43.3%
ASSCPROF	2	14 7.0% 26.9% 2.3% -.7	115 57.5% 46.9% 18.7% 4.0	55 27.5% 30.4% 8.9% -.5	16 8.0% 11.7% 2.6% -4.3	200 32.5%
ASSTPROF	3	29 23.8% 55.8% 4.7% 5.8	66 54.1% 26.9% 10.7% 2.5	15 12.3% 8.3% 2.4% -3.5	12 9.8% 8.8% 2.0% -2.9	122 19.8%
INSTRCTR	4	8 29.6% 15.4% 1.3% 3.8	14 51.9% 5.7% 2.3% 1.0	3 11.1% 1.7% .5% -1.8	2 7.4% 1.5% .3% -1.6	27 4.4%
Column Total		52 8.5%	245 39.8%	181 29.4%	137 22.3%	615 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
216.33231	9	.0000	2.283	1 OF 16 (6.3%)

Number of Missing Observations = 5

Table B-8

Standardized Residual Cross Tabulations: Rank by Gender

GENDER - >	Count Row Pct Col Pct Tot Pct Std Res	Male 1	Female 2	Row Total
RANK				
PROFESSOR	1	240 90.6% 53.9% 39.1% 3.5	25 9.4% 14.8% 4.1% -5.6	265 43.2%
ASSCPROF	2	147 73.5% 33.0% 23.9% .2	53 26.5% 31.4% 8.6% -.3	200 32.6%
ASSTPROF	3	52 42.6% 11.7% 8.5% -3.9	70 57.4% 41.4% 11.4% 6.3	122 19.9%
INSTRCTR	4	6 22.2% 1.3% 1.0% -3.1	21 77.8% 12.4% 3.4% 5.0	27 4.4%
Column Total		445 72.5%	169 27.5%	614 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
132.26302	3	.0000	7.432	None

Number of Missing Observations = 6

Table B-9

Standardized Residual Cross Tabulations: Age by Gender

GENDER - >	Count Row Pct Col Pct Tot Pct Std Res	Male 1	Female 2	Row Total
AGE				
< 35	1	34	18	52
		65.4%	34.6%	8.4%
		7.6%	10.6%	
		5.5%	2.9%	
		-.6	1.0	
35-45	2	165	82	247
		66.8%	33.2%	40.1%
		37.0%	48.2%	
		26.8%	13.3%	
		-1.0	1.7	
46-55	3	138	43	181
		76.2%	23.8%	29.4%
		30.9%	25.3%	
		22.4%	7.0%	
		.6	-1.0	
> 55	4	109	27	136
		80.1%	19.9%	22.1%
		24.4%	15.9%	
		17.7%	4.4%	
		1.1	-1.7	
Column Total		446	170	616
		72.4%	27.6%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
10.57803	3	.0142	14.351	None

Number of Missing Observations = 4

APPENDIX C
STANDARDIZED RESIDUAL CROSS TABULATIONS

Table C-1

Mean Ratings of Each Competency

	Q1 Complex of Human Assoc	Q2 Respect Views	Q3 Civic Matters	Q4 Examine Own V & B	Q5 Peoples of World	Q6 Impact of Decision	Q7 Forma of Value
Agricul	3.03	3.29	2.69	3.27	2.71	2.87	2.50
Busin	3.47	3.37	2.83	3.31	2.95	3.10	2.69
Educ	3.37	3.51	3.04	3.60	3.10	3.28	3.17
Engin	2.88	3.14	2.58	3.14	2.79	2.88	2.58
HomeEc	3.49	3.62	2.94	3.68	3.17	3.41	3.11
Journ	3.00	3.36	2.86	3.07	2.79	2.86	2.86
Music	3.56	3.63	2.89	3.73	3.27	3.21	3.02
Nursg	3.58	3.61	3.04	3.69	3.15	3.27	3.20
Pharm	3.12	3.45	2.88	3.43	2.94	3.08	2.92
LibArts	3.44	3.67	3.13	3.72	3.51	3.51	3.34

Table C-1--Continued

	Q8 Another Culture	Q9 Numbers & Quant	Q10 Scientif Method	Q11 Economic Interde-pendence	Q12 Responds t/Belief & Values	Q13 Disting Beliefs & Facts	Q14 Human Motiv-ation
Agricul	2.40	3.28	3.12	2.72	2.43	3.32	2.83
Busin	2.66	3.24	2.92	3.10	2.61	3.22	3.16
Educ	2.85	2.95	3.06	2.73	2.99	3.43	3.24
Engin	2.49	3.24	3.20	2.72	2.37	3.31	2.51
HomeEc	2.84	3.03	2.86	2.84	2.62	3.43	3.24
Journ	2.71	2.79	2.14	2.21	2.93	2.86	3.00
Music	3.03	2.67	2.52	2.52	2.59	3.37	3.16
Nursg	2.93	3.04	3.23	2.63	2.96	3.23	3.29
Pharm	2.76	3.39	3.36	2.69	2.74	3.42	2.84
LibArts	3.45	3.04	3.13	2.99	3.18	3.65	3.08

Table C-1--Continued

	Q15 Influen of Past	Q16 Foreign Language	Q17 Fine Arts	Q18 Computer Skills	Q19 Problem Solving	Q20 Group Membership	Q21 Aware of Limit
Agricul	2.82	2.14	2.11	2.98	3.13	2.22	2.95
Busin	3.10	2.36	2.41	2.80	2.98	2.69	3.10
Educ	3.04	2.27	2.44	2.71	3.24	2.74	3.14
Engin	2.77	2.29	2.24	2.83	2.95	2.37	2.89
HomeEc	3.19	2.16	2.62	3.05	3.43	2.64	3.19
Journ	3.00	2.07	2.07	2.29	2.64	2.64	2.50
Music	3.26	2.85	3.49	2.50	3.03	2.47	3.02
Nursg	3.06	2.35	2.45	2.93	3.39	2.85	3.49
Pharm	3.00	2.41	2.41	2.90	3.16	2.45	3.20
LibArts	3.54	3.31	2.92	2.66	2.86	2.53	3.08

Table C-1--Continued

	Q22 Language Reflects Culture	Q23 Read	Q24 Science Technol Nature	Q25 Reason Analyze Problems	Q26 Underst Ideolog	Q27 Resource & Environment	Q28 Acquire Knowledge
Agricul	2.07	3.67	3.15	3.66	2.53	2.91	3.56
Busin	2.40	3.74	2.81	3.69	2.75	2.53	3.47
Educ	2.51	3.71	2.90	3.60	2.83	2.91	3.72
Engin	2.11	3.55	3.12	3.53	2.44	2.62	3.51
HomeEc	2.54	3.73	2.89	3.68	2.81	3.11	3.84
Journ	2.57	3.29	2.79	3.50	3.07	2.50	3.50
Music	2.71	3.81	2.77	3.44	2.85	2.85	3.69
Nursg	2.66	3.85	3.13	3.73	2.77	2.85	3.70
Pharm	2.38	3.86	3.29	3.75	2.63	2.90	3.73
LibArts	2.97	3.84	3.21	3.81	3.26	3.24	3.74

Table C-1--Continued

	Q29 Govern-mental Process	Q30 Desire t/Learn & Grow	Q31 Moral Ethical Problems	Q32 Philoso-phy of Life	Q33 Express Thoughts & Ideas	Q34 World's Resources
Agricul	2.59	3.53	3.00	2.57	3.72	2.63
Busin	2.78	3.54	3.22	2.64	3.73	2.92
Educ	2.91	3.70	3.17	3.06	3.71	2.68
Engin	2.58	3.42	2.90	2.38	3.61	2.45
HomeEc	2.89	3.73	3.30	3.19	3.78	2.78
Journ	2.86	3.36	3.21	2.79	3.50	2.64
Music	2.65	3.69	3.34	3.08	3.76	2.52
Nursg	2.91	3.64	3.34	2.97	3.82	2.65
Pharm	2.80	3.55	3.14	2.59	3.71	2.67
LibArts	2.90	3.76	3.52	3.01	3.75	2.90

Table C-2

Standardized Residual Cross Tabulations: Professional Area by Question 9 (Numbers and Quantity)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	14	41	41	96
		14.6%	42.7%	42.7%	15.9%
		9.8%	17.2%	18.6%	
		2.3%	6.8%	6.8%	
		-1.8	.5	1.0	
BUSINESS	2	9	25	25	59
		15.3%	42.4%	42.4%	9.8%
		6.3%	10.5%	11.3%	
		1.5%	4.1%	4.1%	
		-1.3	.3	.7	
EDUCATION	3	24	31	23	78
		30.8%	39.7%	29.5%	12.9%
		16.8%	13.0%	10.4%	
		4.0%	5.1%	3.8%	
		1.3	-.0	-1.0	
ENGINEER	4	17	22	36	75
		22.7%	29.3%	48.0%	12.4%
		11.9%	9.2%	16.3%	
		2.8%	3.6%	6.0%	
		-.2	-1.4	1.6	
HOME ECON	5	5	23	9	37
		13.5%	62.2%	24.3%	6.1%
		3.5%	9.6%	4.1%	
		.8%	3.8%	1.5%	
		-1.3	2.2	-1.2	

Table C-2—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	29 46.0% 20.3% 4.8% 3.6	21 33.3% 8.8% 3.5% -.8	13 20.6% 5.9% 2.2% -2.1	63 10.4%
NURSING	7	16 22.5% 11.2% 2.7% -.2	36 50.7% 15.1% 6.0% 1.5	19 26.8% 8.6% 3.2% -1.4	71 11.8%
PHARMACY	8	8 15.7% 5.6% 1.3% -1.2	15 29.4% 6.3% 2.5% -1.2	28 54.9% 12.7% 4.6% 2.2	51 8.5%
LIB ARTS	9	21 28.8% 14.7% 3.5% .9	25 34.2% 10.5% 4.1% -.7	27 37.0% 12.2% 4.5% .0	73 12.1%
	Column Total	143 23.7%	239 39.6%	221 36.7%	603 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
53.37976	16	.0000	8.774	None

Number of Missing Observations = 3

Table C-3

Standardized Residual Cross Tabulations: Rank by Question 9 (Numbers and Quantity)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY 1	RATHER 2	DECIDED 3	EXTREME 4	Row Total
RANK						
PROFESSOR	1	6 2.3% 31.6% 1.0% -.8	60 22.7% 47.6% 9.8% .8	86 32.6% 35.1% 14.0% -1.9	112 42.4% 50.2% 18.3% 1.6	264 43.1%
ASSCPROF	2	7 3.5% 36.8% 1.1% .3	43 21.6% 34.1% 7.0% .3	81 40.7% 33.1% 13.2% .2	68 34.2% 30.5% 11.1% -.5	199 32.5%
ASSTPROF	3	4 3.3% 21.1% .7% .1	20 16.3% 15.9% 3.3% -1.1	61 49.6% 24.9% 10.0% 1.7	38 30.9% 17.0% 6.2% -1.0	123 20.1%
INSTRCTR	4	2 7.4% 10.5% .3% 1.3	3 11.1% 2.4% .5% -1.1	17 63.0% 6.9% 2.8% 1.9	5 18.5% 2.2% .8% -1.5	27 4.4%
	Column Total	19 3.1%	126 20.6%	245 40.0%	223 36.4%	613 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
21.67241	9	.0100	.837	2 of 16 (12.5%)

Number of Missing Observations = 7

Table C-4

Standardized Residual Cross Tabulations: Professional Area by Question 16 (Foreign Language)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	64	24	8	96
AGRICULT		66.7%	25.0%	8.3%	15.9%
		20.6%	12.8%	7.7%	
		10.6%	4.0%	1.3%	
		2.1	-1.1	-2.1	
	2	27	25	6	58
BUSINESS		46.6%	43.1%	10.3%	9.6%
		8.7%	13.3%	5.8%	
		4.5%	4.1%	1.0%	
		-.5	1.6	-1.3	
	3	47	24	6	77
EDUCATION		61.0%	31.2%	7.8%	12.8%
		15.1%	12.8%	5.8%	
		7.8%	4.0%	1.0%	
		1.2	.0	-2.0	
	4	43	24	6	76
ENGINEER		56.6%	31.6%	11.8%	12.6%
		13.8%	12.8%	8.7%	
		7.1%	4.0%	1.5%	
		.6	.1	-1.1	
	5	26	8	3	37
HOME ECON		70.3%	21.6%	8.1%	6.1%
		8.4%	4.3%	2.9%	
		4.3%	1.3%	.5%	
		1.6	-1.0	-1.3	

Table C-4—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	17	29	16	62
MUSIC		27.4%	46.8%	25.8%	10.3%
		5.5%	15.4%	15.4%	
		2.8%	4.8%	2.7%	
		-2.6	2.2	1.6	
	7	43	20	8	71
NURSING		60.6%	28.2%	11.3%	11.8%
		13.8%	10.6%	7.7%	
		7.1%	3.3%	1.3%	
		1.1	-.5	-1.2	
	8	30	14	7	51
PHARMACY		58.8%	27.5%	13.7%	8.5%
		9.6%	7.4%	6.7%	
		5.0%	2.3%	1.2%	
		.7	-.5	-.6	
	9	14	20	41	75
LIB ARTS		18.7%	26.7%	54.7%	12.4%
		4.5%	10.6%	38.4%	
		2.3%	3.3%	6.8%	
		-4.0	-.7	7.8	
	Column Total	311	188	104	603
		51.6%	31.2%	17.2%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
122.25637	16	.0000	6.381	None

Number of Missing Observations = 3

Table C-5

Standardized Residual Cross Tabulations: Professional Area by Question 22 (Culture Reflected in Language)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	66	25	5	96
AGRICULT		68.8%	26.0%	5.2%	16.1%
		21.9%	12.1%	5.7%	
		11.1%	4.2%	.8%	
		2.5	-1.4	-2.4	
	2	31	19	8	58
BUSINESS		53.4%	32.8%	13.8%	9.7%
		10.3%	9.2%	9.1%	
		5.2%	3.2%	1.3%	
		.3	-.2	-.2	
	3	36	35	7	78
EDUCATION		46.2%	44.9%	9.0%	13.1%
		12.0%	17.0%	8.0%	
		6.1%	5.9%	1.2%	
		-.6	1.5	-1.3	
	4	48	20	5	73
ENGINEER		65.8%	27.4%	6.8%	12.3%
		15.9%	9.7%	5.7%	
		8.1%	3.4%	.8%	
		1.8	-1.0	-1.8	
	5	19	13	5	37
HOME ECON		51.4%	35.1%	13.5%	6.2%
		6.3%	6.3%	5.7%	
		3.2%	2.2%	.8%	
		.1	.1	-.2	

Table C-5--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	26	20	16	62
MUSIC		41.9%	32.3%	25.8%	10.4%
		8.6%	9.7%	18.2%	
		4.4%	3.4%	2.7%	
		-1.0	-.3	2.3	
	7	25	34	9	71
NURSING		52.1%	47.9%	12.7%	11.9%
		8.3%	16.5%	10.2%	
		4.2%	5.7%	1.5%	
		.1	1.9	-.5	
	8	28	18	5	48
PHARMACY		39.4%	37.5%	10.4%	8.1%
		9.3%	8.7%	5.7%	
		4.7%	3.0%	.8%	
		-.3	.3	-.8	
	9	22	22	28	72
LIB ARTS		30.6%	30.6%	38.9%	12.1%
		7.3%	10.7%	31.8%	
		3.7%	3.7%	4.7%	
		-2.4	-.6	5.3	
	Column Total	301 50.6%	206 34.6%	88 14.8%	595 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
73.24245	16	.0000	5.472	None

Number of Missing Observations = 11

Table C-6

Standardized Residual Cross Tabulations: Professional Area by Question 17 (Fine Arts)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	69	21	6	96
AGRICULT		71.9%	21.9%	6.3%	15.9%
		23.1%	10.2%	6.1%	
		11.5%	3.5%	1.0%	
		3.1	-2.0	-2.4	
	2	33	18	8	59
BUSINESS		55.9%	30.5%	13.6%	9.8%
		11.0%	8.8%	8.2%	
		5.5%	3.0%	1.3%	
		.7	-.5	-.5	
	3	40	32	6	78
EDUCATION		51.3%	41.0%	7.7%	13.0%
		13.4%	15.6%	6.1%	
		6.6%	5.3%	1.0%	
		.2	1.1	-1.9	
	4	45	25	5	75
ENGINEER		60.0%	33.3%	6.7%	12.5%
		15.1%	12.2%	5.1%	
		7.5%	4.2%	.8%	
		1.3	-.1	-2.1	
	5	16	17	4	37
HOME ECON		43.2%	45.9%	10.8%	6.1%
		5.4%	8.3%	4.1%	
		2.7%	2.8%	.7%	
		-.6	1.2	-.8	

Table C-6--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	5 8.2% 1.7% .8% -4.6	21 34.4% 10.2% 3.5% .0	35 57.4% 35.7% 5.8% 8.0	61 10.1%
NURSING	7	39 54.9% 13.0% 6.5% .6	26 36.6% 12.7% 4.3% .4	6 8.5% 6.1% 1.0% -1.6	71 11.8%
PHARMACY	8	29 56.9% 9.7% 4.8% .7	16 31.4% 7.8% 2.7% -.3	6 11.8% 6.1% 1.0% -.8	51 8.5%
LIB ARTS	9	23 31.1% 7.7% 3.8% -2.3	29 39.2% 14.1% 4.8% .8	22 29.7% 22.4% 3.7% 2.9	74 12.3%
	Column Total	299 49.7%	205 34.1%	98 16.3%	616 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
136.53188	16	.0000	6.023	None

Number of Missing Observations = 4

Table C-7

Standardized Residual Cross Tabulations: Professional Area by Question 18 (Computer Skills)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	24	42	30	96
AGRICULT		25.0%	43.8%	31.3%	16.0%
		11.3%	17.9%	19.6%	
		4.0%	7.0%	5.0%	
		-1.7	.7	1.1	
	2	18	27	14	59
BUSINESS		30.5%	45.8%	23.7%	9.8%
		8.5%	11.5%	9.2%	
		3.0%	4.5%	2.3%	
		-.6	.8	-.3	
	3	33	29	16	78
EDUCATION		42.3%	37.2%	20.5%	13.0%
		15.6%	12.4%	10.5%	
		5.5%	4.8%	2.7%	
		1.0	-.3	-.9	
	4	32	18	25	75
ENGINEER		42.7%	24.0%	33.3%	12.5%
		15.1%	7.7%	16.3%	
		5.3%	3.0%	4.2%	
		1.1	-2.1	1.3	
	5	10	14	13	37
HOME ECON		27.0%	37.8%	35.1%	6.2%
		4.7%	6.0%	8.5%	
		1.7%	2.3%	2.2%	
		-.9	-.1	1.2	

Table C-7--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	29 48.3% 13.7% 4.8% 1.7	25 41.7% 10.7% 4.2% .3	6 10.0% 3.9% 1.0% -2.4	60 10.0%
NURSING	7	19 26.8% 9.0% 3.2% -1.2	31 43.7% 13.2% 5.2% .6	21 29.6% 13.7% 3.5% .7	71 11.9%
PHARMACY	8	16 32.0% 7.5% 2.7% -.4	20 40.0% 8.5% 3.3% .1	14 28.0% 9.2% 2.3% .3	50 8.3%
LIB ARTS	9	31 42.5% 14.6% 5.2% 1.0	28 38.4% 12.0% 4.7% -.1	14 19.2% 9.2% 2.3% -1.1	73 12.2%
	Column Total	212 35.4%	234 39.1%	153 25.5%	613 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
30.52120	16	.0155	9.451	None

Number of Missing Observations = 7

Table C-8

Standardized Residual Cross Tabulations: Professional Area by Question 23 (Read)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA AGRICULT	1	2 2.1% 12.5% .3% -.4	28 29.2% 23.3% 4.7% 2.0	66 68.8% 14.3% 11.0% -1.0	96 16.0%
BUSINESS	2	2 3.4% 12.5% .3% .4	10 17.2% 8.3% 1.7% -.5	46 79.3% 9.9% 7.7% .2	58 9.7%
EDUCATION	3	3 3.8% 18.8% .5% .6	15 19.2% 12.5% 2.5% -.2	60 76.9% 13.0% 10.0% -.0	78 13.0%
ENGINEER	4	5 6.7% 31.3% .8% 2.1	23 30.7% 19.2% 3.8% 2.1	47 62.7% 10.2% 7.8% -1.4	75 12.5%
HOME ECON	5	1 2.7% 6.3% .2% .0	8 21.6% 6.7% 1.3% .2	28 75.7% 6.0% 4.7% -.1	37 6.2%

Table C-8—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	0	12	50	62
MUSIC		.0%	19.4%	80.6%	10.4%
		.0%	10.0%	10.8%	
		.0%	2.0%	8.3%	
		-1.3	-.1	.3	
	7	1	9	61	71
NURSING		1.4%	12.7%	85.9%	11.9%
		6.3%	7.5%	13.2%	
		.2%	1.5%	10.2%	
		-.7	-1.4	.8	
	8	0	7	42	49
PHARMACY		.0%	14.3%	85.7%	8.2%
		.0%	5.8%	9.1%	
		.0%	1.2%	7.0%	
		-1.1	-.9	.7	
	9	2	8	63	73
LIB ARTS		2.7%	11.0%	86.3%	12.2%
		12.5%	6.7%	13.6%	
		.3%	1.3%	10.5%	
		.0	-1.7	.9	
	Column Total	16 2.7%	120 20.0%	463 77.3%	599 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
27.81578	16	.0333	.988	9 of 27 (33.3%)

Number of Missing Observations = 7

Table C-9

Standardized Residual Cross Tabulations: Professional Area by Question 27 (Resources and Environment)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	32 33.3% 15.2% 5.4% -.3	36 37.5% 16.4% 6.0% .1	28 29.2% 16.6% 4.7% .2	96 16.1%
BUSINESS	2	30 50.8% 14.3% 5.0% 2.0	19 32.2% 8.7% 3.2% -.6	10 16.9% 5.9% 1.7% -1.6	59 9.9%
EDUCATION	3	29 37.2% 13.8% 4.8% .3	23 29.5% 10.5% 3.8% -1.0	26 33.3% 15.4% 4.3% .8	78 13.0%
ENGINEER	4	30 40.5% 14.3% 5.0% .8	33 44.6% 15.1% 5.5% 1.1	11 14.9% 6.5% 1.8% -2.2	74 12.4%
HOME ECON	5	8 21.6% 3.8% 1.3% -1.4	17 45.9% 7.8% 2.8% .9	12 32.4% 7.1% 2.0% .5	37 6.2%

Table C-9--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	24	19	19	62
MUSIC		38.7%	30.6%	30.6%	10.4%
		11.4%	8.7%	11.2%	
		4.0%	3.2%	3.2%	
		.5	-.8	.4	
	7	24	34	13	71
NURSING		33.8%	47.9%	18.3%	11.9%
		11.4%	15.5%	7.7%	
		4.0%	5.7%	2.2%	
		-.2	1.6	-1.6	
	8	18	16	15	49
PHARMACY		36.7%	32.7%	30.6%	8.2%
		8.6%	7.3%	8.9%	
		3.0%	2.7%	2.5%	
		.2	-.5	.3	
	9	15	22	35	72
LIB ARTS		20.8%	30.6%	48.6%	12.0%
		7.1%	10.0%	20.7%	
		2.5%	3.7%	5.9%	
		-2.0	-.9	3.2	
	Column Total	210	219	169	598
		35.1%	36.6%	28.3%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
40.53626	16	.0006	10.457	None

Number of Missing Observations = 8

Table C-10

Standardized Residual Cross Tabulations: Rank by Question 27 (Resources and Environment)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY 1	RATHER 2	DECIDED 3	EXTREME 4	Row Total
RANK						
PROFESSOR	1	21 8.0% 56.8% 3.5% 1.3	69 26.3% 38.8% 11.3% -.9	101 38.5% 45.3% 16.6% .5	71 27.1% 41.8% 11.7% -.3	262 43.1%
ASSOCPROF	2	12 6.1% 32.4% 2.0% .0	55 27.9% 30.9% 9.0% -.4	65 33.0% 29.1% 10.7% -.9	65 33.0% 38.2% 10.7% 1.3	197 32.4%
ASSTPROF	3	2 1.6% 5.4% .3% -2.0	42 34.4% 23.6% 6.9% 1.1	45 36.9% 20.2% 7.4% .0	33 27.0% 19.4% 5.4% -.2	122 20.1%
INSTRUCTR	4	2 7.4% 5.4% .3% .3	12 44.4% 6.7% 2.0% 1.5	12 44.4% 5.4% 2.0% .7	1 3.7% .6% .2% -2.4	27 4.4%
Column Total		37 6.1%	178 29.3%	223 36.7%	170 28.0%	608 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
18.76627	9	.0273	1.643	1 of 16 (6.3%)

Number of Missing Observations = 12

Table C-11

Standardized Residual Cross Tabulations: Professional Area by Question 24 (Science, Technology, and Nature)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	16	44	34	94
		17.0%	46.8%	36.2%	15.8%
		12.4%	15.2%	19.3%	
		2.7%	7.4%	5.7%	
		-1.0	-.3	1.2	
BUSINESS	2	22	23	14	59
		37.3%	39.0%	23.7%	9.9%
		17.1%	7.9%	8.0%	
		3.7%	3.9%	2.4%	
		2.6	-1.1	-.8	
EDUCATION	3	19	44	15	78
		24.4%	56.4%	19.2%	13.1%
		14.7%	15.2%	8.5%	
		3.2%	7.4%	2.5%	
		.5	1.0	-1.7	
ENGINEER	4	16	31	27	74
		21.6%	41.9%	36.5%	12.4%
		12.4%	10.7%	15.3%	
		2.7%	5.2%	4.5%	
		-.0	-.8	1.1	
HOME ECON	5	12	15	9	36
		33.3%	41.7%	25.0%	6.1%
		9.3%	5.2%	5.1%	
		2.0%	2.5%	1.5%	
		1.5	-.6	-.5	

Table C-11—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	20	31	11	62
		32.3%	50.0%	17.7%	10.4%
		15.5%	10.7%	6.3%	
		3.4%	5.2%	1.8%	
		1.8	.1	-1.7	
NURSING	7	7	47	16	70
		14.3%	67.1%	22.9%	11.8%
		5.4%	16.2%	9.1%	
		1.2%	7.9%	2.7%	
		-1.1	2.2	-1.0	
PHARMACY	8	7	20	22	49
		10.0%	40.8%	44.9%	8.2%
		5.4%	6.9%	12.5%	
		1.2%	3.4%	3.7%	
		-2.1	-.8	2.0	
LIB ARTS	9	10	35	28	73
		13.7%	47.9%	38.4%	12.3%
		7.8%	12.1%	15.9%	
		1.7%	5.9%	4.7%	
		-1.5	-.1	1.4	
	Column Total	129	290	176	595
		21.7%	48.7%	29.6%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
45.97166	16	.0001	7.805	None

Number of Missing Observations = 11

Table C-12

Standardized Residual Cross Tabulations: Professional Area by Question 28 (Acquire Knowledge)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	6	29	61	96
		6.3%	30.2%	63.5%	16.0%
		21.4%	20.0%	14.3%	
		1.0%	4.8%	10.2%	
		.7	1.2	-.9	
BUSINESS	2	2	25	32	59
		3.4%	42.4%	54.2%	9.9%
		7.1%	17.2%	7.5%	
		.3%	4.2%	5.3%	
		-.5	2.8	-1.5	
EDUCATION	3	3	14	61	78
		3.8%	17.9%	78.2%	13.0%
		10.7%	9.7%	14.3%	
		.5%	2.3%	10.2%	
		-.3	-1.1	.7	
ENGINEER	4	5	25	45	75
		6.7%	33.3%	60.0%	12.5%
		17.9%	17.2%	10.6%	
		.8%	4.2%	7.5%	
		.8	1.6	-1.1	
HOME ECON	5	1	3	33	37
		2.7%	8.1%	89.2%	6.2%
		3.6%	2.1%	7.7%	
		.2%	.5%	5.5%	
		-.6	-2.0	1.3	

Table C-12--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	2 3.3% 7.1% .3% -.5	15 24.6% 10.3% 2.5% .1	44 72.1% 10.3% 7.3% .1	61 10.2%
NURSING	7	2 2.8% 7.1% .3% -.7	17 23.9% 11.7% 2.8% -.0	52 73.2% 12.2% 8.7% .2	71 11.9%
PHARMACY	8	3 6.1% 10.7% .5% .5	7 14.3% 4.8% 1.2% -1.4	39 79.6% 9.2% 6.5% .7	49 8.2%
LIB ARTS	9	4 5.5% 14.3% .7% .3	10 13.7% 6.9% 1.7% -1.8	59 80.8% 13.8% 9.8% 1.0	73 12.2%
	Column Total	28 4.7%	145 24.2%	426 71.1%	599 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
33.68743	16	.0060	1.730	9 of 27 (33.3%)

Number of Missing Observations = 7

Table C-13

Standardized Residual Cross Tabulations: Professional Area by Question 30 (Desire to Learn and Grow)

PROF AREA	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
AGRICULT	1	8	26	61	95
		8.4%	27.4%	64.2%	16.1%
		19.0%	19.4%	14.7%	
		1.4%	4.4%	10.3%	
		.5	1.0	-.7	
BUSINESS	2	6	13	40	59
		10.2%	22.0%	67.8%	10.0%
		14.3%	9.7%	9.6%	
		1.0%	2.2%	6.8%	
		.9	-.1	-.2	
EDUCATION	3	3	15	58	76
		3.9%	19.7%	76.3%	12.9%
		7.1%	11.2%	14.0%	
		.5%	2.5%	9.8%	
		-1.0	-.5	.6	
ENGINEER	4	5	29	39	73
		6.8%	39.7%	53.4%	12.4%
		11.9%	21.6%	9.4%	
		.8%	4.9%	6.6%	
		-.1	3.1	-1.7	
HOME ECON	5	2	6	29	37
		5.4%	16.2%	78.4%	6.3%
		4.8%	4.5%	7.0%	
		.3%	1.0%	4.9%	
		-.4	-.8	.6	

Table C-13—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	2	15	45	62
MUSIC		3.2%	24.2%	72.6%	10.5%
		4.8%	11.2%	10.8%	
		.3%	2.5%	7.6%	
		-1.1	.3	.2	
	7	5	15	50	70
NURSING		7.1%	21.4%	71.4%	11.6%
		11.9%	11.2%	12.0%	
		.8%	2.5%	8.5%	
		.0	-.2	.1	
	8	6	9	34	49
PHARMACY		12.2%	18.4%	69.4%	8.3%
		14.3%	6.7%	8.2%	
		1.0%	1.5%	5.8%	
		1.3	-.6	-.1	
	9	5	6	59	70
LIB ARTS		7.1%	8.6%	84.3%	11.8%
		11.9%	4.5%	14.2%	
		.8%	1.0%	10.0%	
		.0	-2.5	1.4	
	Column Total	42 7.1%	134 22.7%	415 70.2%	591 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
29.55091	16	.0205	2.629	6 of 27 (22.2%)

Number of Missing Observations = 15

Table C-14

Standardized Residual Cross Tabulations: Professional Area by Question 21 (Aware of Limitations)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	32 33.3% 23.7% 5.4% 2.2	28 29.2% 12.4% 4.7% -1.4	36 37.5% 15.3% 6.0% -.3	96 16.1%
BUSINESS	2	14 23.7% 10.4% 2.3% .2	21 35.6% 9.3% 3.5% -.3	24 40.7% 10.2% 4.0% .1	59 9.9%
EDUCATION	3	14 17.9% 10.4% 2.3% -.9	35 44.9% 15.6% 5.9% 1.0	19 37.2% 12.3% 4.9% -.3	78 13.1%
ENGINEER	4	19 26.0% 14.1% 3.2% .6	35 47.9% 15.6% 5.9% 1.4	29 26.0% 8.1% 3.2% -1.8	73 12.2%
HOME ECON	5	7 18.9% 5.2% 1.2% -.5	13 35.1% 5.8% 2.2% -.3	17 45.9% 7.2% 2.9% .6	37 6.2%

Table C-14--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	18	20	24	62
		29.0%	32.3%	38.7%	10.4%
		13.3%	8.9%	10.2%	
		3.0%	3.4%	4.0%	
		1.1	-.7	-.1	
NURSING	7	4	28	39	71
		5.6%	39.4%	54.9%	11.9%
		3.0%	12.4%	16.5%	
		.7%	4.7%	6.5%	
		-3.0	.2	2.1	
PHARMACY	8	8	23	18	49
		16.3%	46.9%	36.7%	8.2%
		5.9%	10.2%	7.6%	
		1.3%	3.9%	3.0%	
		-.9	1.0	-.3	
LIB ARTS	9	19	22	30	71
		26.8%	31.0%	42.3%	11.9%
		14.1%	9.8%	12.7%	
		3.2%	3.7%	5.0%	
		.7	-.9	.4	
	Column Total	135	225	236	596
		22.7%	37.8%	39.6%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
33.85146	16	.0057	8.381	None

Number of Missing Observations = 10

Table C-15

Standardized Residual Cross Tabulations: Rank by Question 21 (Aware of Limitations)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY 1	RATHER 2	DECIDED 3	EXTREME 4	Row Total
RANK						
PROFESSOR	1	12 4.6% 30.0% 2.0% -1.2	48 18.5% 46.6% 7.9% .6	106 40.8% 47.1% 17.5% 1.0	94 36.2% 39.5% 15.5% -.8	260 42.9%
ASSOCPROF	2	19 9.6% 47.5% 3.1% 1.7	39 19.8% 37.9% 6.4% 1.0	62 31.5% 27.6% 10.2% -1.3	77 39.1% 32.4% 12.7% -.0	197 32.5%
ASSTPROF	3	6 4.9% 15.0% 1.0% -.7	14 11.5% 13.6% 2.3% -1.5	43 35.2% 19.1% 7.1% -.3	59 48.4% 24.8% 9.7% 1.6	122 20.1%
INSTRUCTR	4	3 11.1% 7.5% .5% .9	2 7.4% 1.9% .3% -1.2	14 51.9% 6.2% 2.3% 1.3	8 29.6% 3.4% 1.3% -.8	27 4.5%
Column Total		40 6.6%	103 17.0%	225 37.1%	238 39.3%	606 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
18.72867	9	.0276	1.782	2 of 16 (12.5%)

Number of Missing Observations = 14

Table C-16

Standardized Residual Cross Tabulations: Professional Area by Question 10 (Scientific Method)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	21 21.9% 13.8% 3.5% -.6	41 42.7% 16.6% 6.8% .3	34 35.4% 16.6% 5.6% .2	96 15.9%
BUSINESS	2	19 32.2% 12.5% 3.1% 1.1	21 35.6% 8.5% 3.5% -.6	19 32.2% 9.3% 3.1% -.2	59 9.8%
EDUCATION	3	17 21.8% 11.2% 2.8% -.6	38 48.7% 15.4% 6.3% 1.1	23 29.5% 11.2% 3.8% -.7	78 12.9%
ENGINEER	4	15 20.0% 9.9% 2.5% -.9	29 38.7% 11.7% 4.8% -.3	31 41.3% 15.1% 5.1% 1.1	75 12.4%
HOME ECON	5	12 32.4% 7.9% 2.0% .9	17 45.9% 6.9% 2.8% .5	8 21.6% 3.9% 1.3% -1.3	37 6.1%

Table C-16--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	34	19	10	63
MUSIC		54.0%	30.2%	15.9%	10.4%
		22.4%	7.7%	4.9%	
		5.6%	3.1%	1.7%	
		4.6	-1.3	-2.5	
	7	11	33	27	71
NURSING		15.5%	46.5%	38.0%	11.8%
		7.2%	13.4%	13.2%	
		1.8%	5.5%	4.5%	
		-1.6	.7	.6	
	8	6	20	24	50
PHARMACY		12.0%	40.0%	48.0%	8.3%
		3.9%	8.1%	11.7%	
		1.0%	3.3%	4.0%	
		-1.9	-.1	1.7	
	9	17	29	29	75
LIB ARTS		22.7%	38.7%	38.7%	12.4%
		11.2%	11.7%	14.1%	
		2.8%	4.8%	4.8%	
		-.4	-.3	.7	
	Column Total	152 25.2%	247 40.9%	205 33.9%	604 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
48.17206	16	.0000	9.311	None

Number of Missing Observations = 2

Table C-17

Standardized Residual Cross Tabulations: Rank by Question 10 (Scientific Method)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY 1	RATHER 2	DECIDED 3	EXTREME 4	Row Total
RANK						
	1	4	56	106	99	265
PROFESSOR		1.5%	21.1%	40.0%	37.4%	43.2%
		21.1%	39.2%	42.9%	48.3%	
		.7%	9.1%	17.3%	16.1%	
		-1.5	-.7	-.1	1.1	
	2	11	43	80	66	200
ASSOCPROF		5.5%	21.5%	40.0%	33.0%	32.6%
		57.9%	30.1%	32.4%	32.2%	
		1.8%	7.0%	13.0%	10.7%	
		1.9	-.5	-.1	-.1	
	3	3	37	45	37	122
ASSTPROF		2.5%	30.3%	36.9%	30.3%	19.9%
		15.8%	25.9%	18.2%	18.0%	
		.5%	6.0%	7.3%	6.0%	
		-.4	1.6	-.6	-.6	
	4	1	7	16	3	27
INSTRUCTR		3.7%	25.9%	59.3%	11.1%	4.4%
		5.3%	4.9%	6.5%	1.5%	
		.2%	1.1%	2.6%	.5%	
		.2	.3	1.6	-2.0	
Column Total		19	143	247	205	614
		3.1%	23.3%	40.2%	33.4%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
17.95463	9	.0357	.836	2 of 16 (12.5%)

Number of Missing Observations = 6

Table C-18

Standardized Residual Cross Tabulations: Professional Area by Question 2 (Respect Views of Others)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	12	44	40	96
AGRICULT		12.5%	45.8%	41.7%	16.0%
		20.3%	22.3%	11.6%	
		2.0%	7.3%	6.7%	
		.8	2.2	-2.0	
	2	8	18	33	59
BUSINESS		13.6%	30.5%	55.9%	9.8%
		13.6%	9.1%	9.6%	
		1.3%	3.0%	5.5%	
		.9	-.3	-.1	
	3	6	25	47	78
EDUCATION		7.7%	32.1%	60.3%	13.0%
		10.2%	12.7%	13.6%	
		1.0%	4.2%	7.8%	
		-.6	-.1	.3	
	4	10	40	23	73
ENGINEER		13.7%	54.8%	31.5%	12.1%
		16.9%	20.3%	6.7%	
		1.7%	6.7%	3.8%	
		1.1	3.3	-2.9	
	5	2	40	23	37
HOME ECON		5.4%	27.0%	67.6%	6.2%
		3.4%	5.1%	7.2%	
		.3%	1.7%	4.2%	
		-.9	-.6	.8	

Table C-18—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA MUSIC	6	3 4.8% 5.1% .5% -1.3	17 27.0% 8.6% 2.8% -.8	43 68.3% 12.5% 7.2% 1.1	63 10.5%
NURSING	7	5 7.0% 8.5% .8% -.7	18 25.4% 9.1% 3.0% -1.1	48 67.6% 13.9% 8.0% 1.1	71 11.8%
PHARMACY	8	9 17.6% 15.3% 1.5% 1.8	9 17.6% 4.6% 1.5% -1.9	33 64.7% 9.6% 5.5% .7	51 8.5%
LIB ARTS	9	4 5.5% 6.8% .7% -1.2	16 21.9% 8.1% 2.7% -1.6	53 72.6% 15.4% 8.8% 1.7	73 12.1%
	Column Total	59 9.8%	197 32.8%	345 57.4%	601 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
54.29271	16	.0000	3.632	1 of 27 (3.7%)

Number of Missing Observations = 5

Table C-19

Standardized Residual Cross Tabulations: Professional Area by Question 4 (Examine Own Values and Beliefs)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	13 13.5% 26.0% 2.2% 1.8	43 44.8% 21.6% 7.1% 2.0	40 41.7% 11.3% 6.6% -2.2	96 15.9%
BUSINESS	2	8 13.6% 16.0% 1.3% 1.4	24 40.7% 12.1% 4.0% 1.0	27 45.8% 7.6% 4.5% -1.3	59 9.8%
EDUCATION	3	2 2.6% 4.0% .3% -1.7	26 33.8% 13.1% 4.3% .1	49 63.6% 13.9% 8.1% .6	77 12.8%
ENGINEER	4	16 21.6% 32.0% 2.7% 4.0	29 39.2% 14.6% 4.8% .9	29 39.2% 8.2% 4.8% -2.2	74 12.3%
HOME ECON	5	1 2.7% 2.0% .2% -1.2	10 27.0% 5.0% 1.7% -.6	26 70.3% 7.4% 4.3% .9	37 6.1%

Table C-19--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	1 1.6% 2.0% .2% -1.9	15 23.8% 7.5% 2.5% -1.3	47 74.6% 13.3% 7.8% 1.7	63 10.5%
NURSING	7	1 1.4% 2.0% .2% -2.0	20 28.2% 10.1% 3.3% -.7	50 70.4% 14.2% 8.3% 1.3	71 11.8%
PHARMACY	8	6 11.8% 12.0% 1.0% .9	15 29.4% 7.5% 2.5% -.5	30 58.8% 8.5% 5.0% .0	51 8.5%
LIB ARTS	9	2 2.7% 4.0% .3% -1.7	17 23.0% 8.5% 2.8% -1.5	55 74.3% 15.6% 9.1% 1.8	74 12.3%
	Column Total	50 8.3%	199 33.1%	352 58.6%	602 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
67.15370	16	.0000	3.073	3 of 27 (11.1%)

Number of Missing Observations = 4

Table C-20

Standardized Residual Cross Tabulations: Professional Area by Question 7 (Formation of Values)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	45	42	9	96
AGRICULT		46.9%	43.8%	9.4%	16.0%
		25.3%	17.0%	5.1%	
		7.5%	7.0%	1.5%	
		3.1	.4	-3.6	
	2	25	18	16	59
BUSINESS		42.4%	30.5%	27.1%	9.8%
		14.0%	7.3%	9.1%	
		4.2%	3.0%	2.7%	
		1.8	-1.3	-.3	
	3	13	35	29	77
EDUCATION		16.9%	45.5%	37.7%	12.8%
		7.3%	14.2%	16.6%	
		2.2%	5.8%	4.8%	
		-2.1	.6	1.4	
	4	34	26	13	73
ENGINEER		46.6%	35.6%	17.8%	12.2%
		19.1%	10.5%	7.4%	
		5.7%	4.3%	2.2%	
		2.7	-.7	-1.8	
	5	8	17	12	37
HOME ECON		21.6%	45.9%	32.4%	6.2%
		4.5%	6.9%	6.9%	
		1.3%	2.8%	2.0%	
		-.9	.5	.4	

Table C-20—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	15	29	19	63
MUSIC		23.8%	46.0%	30.2%	10.5%
		8.4%	11.7%	10.9%	
		2.5%	4.8%	3.2%	
		-.9	.6	.1	
	7	10	37	24	71
NURSING		14.1%	52.1%	33.8%	11.8%
		5.6%	15.0%	13.7%	
		1.7%	6.2%	4.0%	
		-2.4	1.4	.7	
	8	15	21	15	51
PHARMACY		29.4%	41.2%	29.4%	8.5%
		8.4%	8.5%	8.6%	
		2.5%	3.5%	2.5%	
		-.0	.0	.0	
	9	13	22	38	73
LIB ARTS		17.8%	30.1%	52.1%	12.2%
		7.3%	8.9%	21.7%	
		2.2%	3.7%	6.3%	
		-1.9	-1.5	3.6	
	Column Total	178 29.7%	247 41.2%	175 29.2%	600 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
74.24784	16	.0000	10.792	None

Number of Missing Observations = 6

Table C-21

Standardized Residual Cross Tabulations: Professional Area by Question 12 (Responds to Beliefs and Values)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	52	36	7	95
		54.7%	37.9%	7.4%	15.9%
		22.7%	14.0%	6.3%	
		8.7%	6.0%	1.2%	
		2.6	-.8	-2.6	
BUSINESS	2	25	24	10	59
		42.4%	40.7%	16.9%	9.8%
		10.9%	9.3%	8.9%	
		4.2%	4.0%	1.7%	
		.5	-.3	-.3	
EDUCATION	3	16	45	17	78
		20.5%	57.7%	21.8%	13.0%
		7.0%	17.4%	15.2%	
		2.7%	7.5%	2.8%	
		-2.5	2.0	.6	
ENGINEER	4	38	29	6	73
		52.1%	39.7%	8.2%	12.2%
		16.6%	11.2%	5.4%	
		6.3%	4.8%	1.0%	
		1.9	-.4	-2.1	
HOME ECON	5	15	18	4	37
		40.5%	48.6%	10.8%	6.2%
		6.6%	7.0%	3.6%	
		2.5%	3.0%	.7%	
		.2	.5	-1.1	

Table C-21--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	28	26	9	63
		44.4%	41.3%	14.3%	10.5%
		12.2%	10.1%	8.0%	
		4.7%	4.3%	1.5%	
		.8	-.2	-.8	
NURSING	7	21	31	19	71
		29.6%	43.7%	26.8%	11.9%
		9.2%	12.0%	17.0%	
		3.5%	5.2%	3.2%	
		-1.2	.1	1.6	
PHARMACY	8	20	19	11	50
		40.0%	38.0%	22.0%	8.3%
		8.7%	7.4%	9.8%	
		3.3%	3.2%	1.8%	
		.2	-.5	.5	
LIB ARTS	9	14	30	29	73
		19.2%	41.1%	39.7%	12.2%
		6.1%	11.6%	25.9%	
		2.3%	5.0%	4.8%	
		-2.6	-.3	4.2	
	Column Total	229	258	112	599
		38.2%	43.1%	18.7%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
64.77122	16	.0000	6.918	None

Number of Missing Observations = 7

Table C-22

Standardized Residual Cross Tabulations: Professional Area by Question 26 (Understand Ideologies)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	50	34	12	96
		52.1%	35.4%	12.5%	16.2%
		22.0%	13.8%	10.0%	
		8.4%	5.7%	2.0%	
		2.2	-.9	-1.7	
BUSINESS	2	24	24	11	59
		40.7%	40.7%	18.6%	9.9%
		10.6%	9.7%	9.2%	
		4.0%	4.0%	1.9%	
		.3	-.1	-.3	
EDUCATION	3	24	36	18	78
		30.8%	46.2%	23.1%	13.1%
		10.6%	14.6%	15.0%	
		4.0%	6.1%	3.0%	
		-1.1	.6	.6	
ENGINEER	4	39	23	10	72
		54.2%	31.9%	13.9%	12.1%
		17.2%	9.3%	8.3%	
		6.6%	3.9%	1.7%	
		2.2	-1.3	-1.2	
HOME ECON	5	12	20	5	37
		32.4%	54.1%	13.5%	6.2%
		5.3%	8.1%	4.2%	
		2.0%	3.4%	.8%	
		-.6	1.2	-.9	

Table C-22—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	22	25	15	62
MUSIC		35.5%	40.3%	24.2%	10.4%
		9.7%	10.1%	12.5%	
		3.7%	4.2%	2.5%	
		-.3	-.2	.7	
	7	24	38	9	71
NURSING		33.8%	53.5%	12.7%	12.0%
		10.6%	15.4%	7.5%	
		4.0%	6.4%	1.5%	
		-.6	1.6	-1.4	
	8	21	18	10	49
PHARMACY		42.9%	36.7%	20.4%	8.2%
		9.3%	7.3%	8.3%	
		3.5%	3.0%	1.7%	
		.5	-.5	-.0	
	9	11	29	30	70
LIB ARTS		15.7%	41.4%	42.9%	11.8%
		4.8%	11.7%	25.0%	
		1.9%	4.9%	5.1%	
		-3.0	.0	4.2	
	Column Total	227	247	120	594
		38.2%	41.6%	20.2%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
53.92915	16	.0000	7.475	None

Number of Missing Observations = 12

Table C-23

Standardized Residual Cross Tabulations: Professional Area by Question 31 (Moral and Ethical Problems)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	19	53	24	96
AGRICULT		19.8%	55.2%	25.0%	16.1%
		18.6%	20.5%	10.2%	
		3.2%	8.9%	4.0%	
		.6	1.8	-2.3	
	2	10	26	23	59
BUSINESS		16.9%	44.1%	39.0%	9.9%
		9.8%	10.1%	9.8%	
		1.7%	4.4%	3.9%	
		-.0	.1	-.1	
	3	13	36	29	78
EDUCATION		16.7%	46.2%	37.2%	13.1%
		12.7%	14.0%	12.3%	
		2.2%	6.1%	4.9%	
		-.1	.4	-.3	
	4	21	34	17	72
ENGINEER		29.2%	47.2%	23.6%	12.1%
		20.6%	13.2%	7.2%	
		3.5%	5.7%	2.9%	
		2.5	.5	-2.1	
	5	6	13	18	37
HOME ECON		16.2%	35.1%	48.6%	6.2%
		5.9%	5.0%	7.7%	
		1.0%	2.2%	3.0%	
		-.1	-.8	.9	

Table C-23--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	7	27	28	62
MUSIC		11.3%	43.5%	45.2%	10.4%
		6.9%	10.5%	11.9%	
		1.2%	4.5%	4.7%	
		-1.1	.0	.7	
	7	9	29	33	71
NURSING		12.7%	40.8%	46.5%	11.9%
		8.8%	11.2%	14.0%	
		1.5%	4.9%	5.5%	
		-.9	-.3	.9	
	8	12	17	20	49
PHARMACY		24.5%	34.7%	40.8%	8.2%
		11.8%	6.6%	8.5%	
		2.0%	2.9%	3.4%	
		1.2	-.9	.1	
	9	5	23	43	71
LIB ARTS		7.0%	32.4%	60.6%	11.9%
		4.9%	8.9%	18.3%	
		.8%	3.9%	7.2%	
		-2.1	-1.4	2.8	
	Column Total	102	258	235	595
		17.1%	43.4%	39.5%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
41.31314	16	.0005	6.343	None

Number of Missing Observations = 11

Table C-24

Standardized Residual Cross Tabulations: Professional Area by Question 32 (Philosophy of Life)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	44	37	15	96
		45.8%	38.5%	15.6%	16.3%
		21.6%	16.2%	9.6%	
		7.5%	6.3%	2.5%	
		1.9	-.0	-2.1	
BUSINESS	2	26	20	12	58
		44.8%	34.5%	20.7%	9.8%
		12.7%	8.7%	7.6%	
		4.4%	3.4%	2.0%	
		1.3	-.5	-.9	
EDUCATION	3	19	29	30	78
		24.4%	37.2%	38.5%	13.2%
		9.3%	12.7%	19.1%	
		3.2%	4.9%	5.1%	
		-1.5	-.2	2.0	
ENGINEER	4	39	24	8	71
		54.9%	33.8%	11.3%	12.0%
		19.1%	10.5%	5.1%	
		6.6%	4.1%	1.4%	
		2.9	-.7	-2.5	
HOME ECON	5	6	17	14	37
		16.2%	45.9%	37.8%	6.3%
		2.9%	7.4%	8.9%	
		1.0%	2.9%	2.4%	
		-1.9	.7	1.3	

Table C-24--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	17	19	26	62
		27.4%	30.6%	41.9%	10.5%
		8.3%	8.3%	16.6%	
		2.9%	3.2%	4.4%	
		-1.0	-1.0	2.3	
NURSING	7	17	36	18	71
		23.9%	50.7%	25.4%	12.0%
		8.3%	15.7%	11.5%	
		2.9%	6.1%	3.1%	
		-1.5	1.6	-.2	
PHARMACY	8	21	17	11	49
		42.9%	34.7%	22.4%	8.3%
		10.3%	7.4%	7.0%	
		3.6%	2.9%	1.9%	
		1.0	-.5	-.6	
LIB ARTS	9	15	30	23	68
		22.1%	44.1%	33.8%	11.5%
		7.4%	13.1%	14.6%	
		2.5%	5.1%	3.9%	
		-1.8	.7	1.2	
	Column Total	204	229	157	590
		34.6%	38.8%	26.6%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
57.11334	16	.0000	9.846	None

Number of Missing Observations = 16

Table C-25

Standardized Residual Cross Tabulations: Professional Area by Question 1 (Complexity of Human Association)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	21	48	25	94
AGRICULT		22.3%	51.1%	26.6%	15.8%
		23.1%	22.2%	8.7%	
		3.5%	8.1%	4.2%	
		1.7	2.4	-3.0	
	2	8	15	36	59
BUSINESS		13.6%	25.4%	61.0%	9.9%
		8.8%	6.9%	12.5%	
		1.3%	2.5%	6.1%	
		-.3	-1.4	1.4	
	3	8	30	38	76
EDUCATION		10.5%	39.5%	50.0%	12.8%
		8.8%	13.9%	13.2%	
		1.3%	5.1%	6.4%	
		-1.1	.4	.2	
	4	22	32	19	73
ENGINEER		30.1%	43.8%	26.0%	12.3%
		24.2%	14.8%	6.6%	
		3.7%	5.4%	3.2%	
		3.2	1.1	-2.7	
	5	2	15	20	37
HOME ECON		5.4%	40.5%	54.1%	6.2%
		2.2%	6.9%	7.0%	
		.3%	2.5%	3.4%	
		-1.5	.4	.5	

Table C-25—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	6 9.8% 6.6% 1.0% -1.1	15 24.6% 6.9% 2.5% -1.5	40 65.6% 13.9% 6.7% 1.9	61 10.3%
NURSING	7	5 7.0% 5.5% .8% -1.8	18 25.4% 8.3% 3.0% -1.5	48 67.6% 16.7% 8.1% 2.3	71 12.0%
PHARMACY	8	12 23.5% 13.2% 2.0% 1.5	18 35.3% 8.3% 3.0% -.1	21 41.2% 7.3% 3.5% -.7	51 8.6%
LIB ARTS	9	7 9.7% 7.7% 1.2% -1.2	25 34.7% 11.6% 4.2% -.2	40 55.6% 13.9% 6.7% .9	72 12.1%
	Column Total	91 15.3%	216 36.4%	287 48.3%	594 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
68.49633	16	.0000	5.668	None

Number of Missing Observations = 12

Table C-26

Standardized Residual Cross Tabulations: Professional Area by Question 5 (Peoples of the World)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	39	40	17	96
AGRICULT		40.6%	41.7%	17.7%	16.0%
		27.9%	14.9%	8.9%	
		6.5%	6.7%	2.8%	
		3.5	-.5	-2.5	
	2	17	23	19	59
BUSINESS		28.8%	39.0%	32.2%	9.8%
		12.1%	8.6%	9.9%	
		2.8%	3.8%	3.2%	
		.9	-.7	.0	
	3	17	36	25	78
EDUCATION		21.8%	46.2%	32.1%	13.0%
		12.1%	13.4%	13.0%	
		2.8%	6.0%	4.2%	
		-.3	.2	.0	
	4	23	36	14	73
ENGINEER		31.5%	49.3%	19.2%	12.1%
		16.4%	13.4%	7.3%	
		3.8%	6.0%	2.3%	
		1.5	.6	-1.9	
	5	6	18	12	36
HOME ECON		16.7%	50.0%	33.3%	6.0%
		4.3%	6.7%	6.3%	
		1.0%	3.0%	2.0%	
		-.8	.5	.1	

Table C-26—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	10 15.9% 7.1% 1.7% -1.2	26 41.3% 9.7% 4.3% -.4	27 42.9% 14.1% 4.5% 1.5	63 10.5%
NURSING	7	14 19.7% 10.0% 2.3% -.6	32 45.1% 11.9% 5.3% .0	25 35.2% 13.0% 4.2% .5	71 11.8%
PHARMACY	8	13 25.5% 9.3% 2.2% .3	24 47.1% 8.9% 4.0% .2	14 27.5% 7.3% 2.3% -.6	51 8.5%
LIB ARTS	9	1 1.4% .7% .2% -3.9	34 45.9% 12.6% 5.7% .2	39 52.7% 20.3% 6.5% 3.2	74 12.3%
	Column Total	140 23.3%	269 44.8%	192 31.9%	601 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
57.51928	16	.0000	8.386	None

Number of Missing Observations = 5

Table C-27

Standardized Residual Cross Tabulations: Professional Area by Question 8 (Another Culture)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	57	25	14	96
AGRICULT		59.4%	26.0%	14.6%	15.9%
		25.2%	11.4%	8.9%	
		9.5%	4.1%	2.3%	
		3.5	-1.7	-2.2	
	2	25	22	12	59
BUSINESS		42.4%	37.3%	20.3%	9.8%
		11.1%	10.0%	7.6%	
		4.1%	3.6%	2.0%	
		.6	.1	-.9	
	3	26	32	20	78
EDUCATION		33.3%	41.0%	25.6%	12.9%
		11.5%	14.6%	12.7%	
		4.3%	5.3%	3.3%	
		-.6	.7	-.1	
	4	40	23	11	74
ENGINEER		54.1%	31.1%	14.9%	12.3%
		17.7%	10.5%	7.0%	
		6.6%	3.8%	1.8%	
		2.3	-.7	-1.9	
	5	13	15	9	37
HOME ECON		35.1%	40.5%	24.3%	6.1%
		5.8%	6.8%	5.7%	
		2.2%	2.5%	1.5%	
		-.2	.4	-.2	

Table C-27--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	16 25.4% 7.1% 2.7% -1.6	26 41.3% 11.9% 4.3% .7	21 33.3% 13.3% 3.5% 1.1	63 10.4%
NURSING	7	20 28.2% 8.8% 3.3% -1.3	35 49.3% 16.0% 5.8% 1.8	16 22.5% 10.1% 2.7% -.6	71 11.8%
PHARMACY	8	21 42.0% 9.3% 3.5% .5	16 32.0% 7.3% 2.7% -.5	13 26.0% 8.2% 2.2% .0	50 8.3%
LIB ARTS	9	8 10.7% 3.5% 1.3% -3.8	25 33.3% 11.4% 4.1% -.4	42 56.0% 26.6% 7.0% 5.0	75 12.4%
	Column Total	226 37.5%	219 36.3%	158 26.2%	603 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
81.84190	16	.0000	9.695	None

Number of Missing Observations = 3

Table C-28

Standardized Residual Cross Tabulations: Professional Area by Question 14 (Human Motivation)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	30 31.9% 19.0% 5.1% 1.0	46 48.9% 19.2% 7.7% 1.3	18 19.1% 9.2% 3.0% -2.3	94 15.8%
BUSINESS	2	11 19.3% 7.0% 1.9% -1.1	24 42.1% 10.0% 4.0% .2	22 38.6% 11.2% 3.7% .7	57 9.6%
EDUCATION	3	11 14.1% 7.0% 1.9% -2.1	35 44.9% 14.6% 5.9% .6	32 41.0% 16.3% 5.4% 1.2	78 13.1%
ENGINEER	4	37 50.0% 23.4% 6.2% 3.9	27 36.5% 11.3% 4.5% -.5	10 13.5% 5.1% 1.7% -2.9	74 12.5%
HOME ECON	5	5 13.5% 3.2% .8% -1.5	18 48.6% 7.5% 3.0% .8	14 37.8% 7.1% 2.4% .5	37 6.2%

Table C-28--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	6	14	23	25	62
MUSIC		22.6%	37.1%	40.3%	10.4%
		8.9%	9.6%	12.8%	
		2.4%	3.9%	4.2%	
		-.6	-.4	1.0	
	7	11	26	31	68
NURSING		16.2%	38.2%	45.6%	11.4%
		7.0%	10.8%	15.8%	
		1.9%	4.4%	5.2%	
		-1.7	-.3	1.8	
	8	20	16	15	51
PHARMACY		39.2%	31.4%	29.4%	8.6%
		12.7%	6.7%	7.7%	
		3.4%	2.7%	2.5%	
		1.7	-1.0	-.4	
	9	19	25	29	73
LIB ARTS		26.0%	34.2%	39.7%	12.3%
		12.0%	10.4%	14.8%	
		3.2%	4.2%	4.9%	
		-.1	-.8	1.0	
	Column Total	158 26.6%	240 40.4%	196 33.0%	594 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
57.31630	16	.0000	9.842	None

Number of Missing Observations = 12

Table C-29

Standardized Residual Cross Tabulations: Professional Area by Question 15 (Influence of the Past)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	35	39	22	96
AGRICULT		36.5%	40.6%	22.9%	16.0%
		24.5%	15.7%	10.6%	
		5.8%	6.5%	3.7%	
		2.5	-.1	-2.0	
	2	16	20	22	58
BUSINESS		27.6%	34.5%	37.9%	9.7%
		11.2%	8.0%	10.6%	
		2.7%	3.3%	3.7%	
		.6	-.8	.4	
	3	18	32	27	77
EDUCATION		23.4%	41.6%	35.1%	12.8%
		12.6%	12.9%	13.0%	
		3.0%	5.3%	4.5%	
		-.1	.0	.1	
	4	25	34	16	75
ENGINEER		33.3%	45.3%	21.3%	12.5%
		17.5%	13.7%	7.7%	
		4.2%	5.7%	2.7%	
		1.7	.5	-2.0	
	5	5	19	12	36
HOME ECON		13.9%	52.8%	33.3%	6.0%
		3.5%	7.6%	5.8%	
		.8%	3.2%	2.0%	
		-1.2	1.1	-.1	

Table C-29--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	7 11.3% 4.9% 1.2% -2.0	29 46.8% 11.6% 4.8% .6	26 41.9% 12.5% 4.3% 1.0	62 10.3%
NURSING	7	13 18.3% 9.1% 2.2% -1.0	40 56.3% 16.1% 6.7% 1.9	18 25.4% 8.7% 3.0% -1.3	71 11.8%
PHARMACY	8	16 31.4% 11.2% 2.7% 1.1	19 37.3% 7.6% 3.2% -.5	16 31.4% 7.7% 2.7% -.4	51 8.5%
LIB ARTS	9	8 10.8% 5.6% 1.3% -2.3	17 23.0% 6.8% 2.8% -2.5	49 66.2% 23.6% 8.2% 4.6	74 12.3%
	Column Total	143 23.8%	249 41.5%	208 34.7%	600 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
67.18465	16	.0000	8.580	None

Number of Missing Observations = 6

Table C-30

Standardized Residual Cross Tabulations: Professional Area by Question 6 (Impact of Decisions)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	31	42	22	95
		32.6%	44.2%	23.2%	15.9%
		26.7%	16.6%	9.6%	
		5.2%	7.0%	3.7%	
		2.9	.3	-2.4	
BUSINESS	2	14	20	24	58
		24.1%	34.5%	41.4%	9.7%
		12.1%	7.9%	10.5%	
		2.3%	3.3%	4.0%	
		.8	-.9	.4	
EDUCATION	3	8	38	32	78
		10.3%	48.7%	41.0%	13.0%
		6.9%	15.0%	14.0%	
		1.3%	6.4%	5.4%	
		-1.8	.9	.4	
ENGINEER	4	22	34	17	73
		30.1%	46.6%	23.3%	12.2%
		19.0%	13.4%	7.4%	
		3.7%	5.7%	2.8%	
		2.1	.6	-2.1	
HOME ECON	5	3	16	18	37
		8.1%	43.2%	48.6%	6.2%
		2.6%	6.3%	7.9%	
		.5%	2.7%	3.0%	
		-1.6	.1	1.0	

Table C-30--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	11 17.5% 9.5% 1.8% -.3	27 42.9% 10.7% 4.5% .1	25 39.7% 10.9% 4.2% .2	63 10.5%
NURSING	7	9 12.7% 7.8% 1.5% -1.3	33 46.5% 13.0% 5.5% .5	29 40.8% 12.7% 4.8% .3	71 11.9%
PHARMACY	8	12 23.5% 10.3% 2.0% .7	20 39.2% 7.9% 3.3% -.3	19 37.3% 8.3% 3.2% -.1	51 8.5%
LIB ARTS	9	6 8.3% 5.2% 1.0% -2.1	23 31.9% 9.1% 3.8% -1.4	43 59.7% 18.8% 7.2% 2.9	72 12.0%
	Column Total	116 19.4%	253 42.3%	229 38.3%	598 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
50.49669	16	.0000	7.177	None

Number of Missing Observations = 8

Table C-31

Standardized Residual Cross Tabulations: Professional Area by Question 11 (Economic Interdependence)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
	1	36	43	17	96
AGRICULT		37.5%	44.8%	17.7%	16.0%
		15.9%	17.1%	13.7%	
		6.0%	7.2%	2.8%	
		-.0	.5	-.6	
	2	13	24	22	59
BUSINESS		22.0%	40.7%	37.3%	9.8%
		5.8%	9.6%	17.7%	
		2.2%	4.0%	3.7%	
		-2.0	-.1	2.8	
	3	32	31	15	78
EDUCATION		41.0%	39.7%	19.2%	13.0%
		14.2%	12.4%	12.1%	
		5.3%	5.2%	2.5%	
		.5	-.3	-.3	
	4	30	27	17	74
ENGINEER		40.5%	36.5%	23.0%	12.3%
		13.3%	10.8%	13.7%	
		5.0%	4.5%	2.8%	
		.4	-.7	.4	
	5	12	17	8	37
HOME ECON		32.4%	45.9%	21.6%	6.2%
		5.3%	6.8%	6.5%	
		2.0%	2.8%	1.3%	
		-.5	.4	.1	

Table C-31—Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	33	22	8	63
		52.4%	34.9%	12.7%	10.5%
		14.6%	8.8%	6.5%	
		5.5%	3.7%	1.3%	
		1.9	-.8	-1.4	
NURSING	7	30	34	7	71
		42.3%	47.9%	9.9%	11.8%
		13.3%	13.5%	5.6%	
		5.0%	5.7%	1.2%	
		.6	.8	-2.0	
PHARMACY	8	20	21	8	49
		40.8%	42.9%	16.3%	8.2%
		8.8%	8.4%	6.5%	
		3.3%	3.5%	1.3%	
		.4	.1	-.7	
LIB ARTS	9	20	32	22	74
		27.0%	43.2%	29.7%	12.3%
		8.8%	12.7%	17.7%	
		3.3%	5.3%	3.7%	
		-1.5	.2	1.7	
	Column Total	226	251	124	601
		37.6%	41.8%	20.6%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
31.17453	16	.0128	7.634	None

Number of Missing Observations = 5

Table C-32

Standardized Residual Cross Tabulations: Professional Area by Question 34 (World's Resources)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
AGRICULT	1	44 45.8% 17.7% 7.4% .6	35 36.5% 14.8% 5.9% -.5	17 17.7% 15.5% 2.9% -.2	96 16.1%
BUSINESS	2	20 33.9% 8.0% 3.4% -.9	19 32.2% 8.0% 3.2% -.9	20 33.9% 18.2% 3.4% 2.8	59 9.9%
EDUCATION	3	31 39.7% 12.4% 5.2% -.3	34 43.6% 14.3% 5.7% .5	13 16.7% 11.8% 2.2% -.4	78 13.1%
ENGINEER	4	38 52.1% 15.3% 6.4% 1.4	27 37.0% 11.4% 4.5% -.4	8 11.0% 7.3% 1.3% -1.5	73 12.2%
HOME ECON	5	11 29.7% 4.4% 1.8% -1.1	20 54.1% 8.4% 3.4% 1.4	6 16.2% 5.5% 1.0% -.3	37 6.2%

Table C-32--Continued

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY & RATHER 1 & 2	DECIDED 3	EXTREME 4	Row Total
PROF AREA					
MUSIC	6	31 50.0% 12.4% 5.2% 1.0	26 41.9% 11.0% 4.4% .3	5 8.1% 4.5% .8% -1.9	62 10.4%
NURSING	7	28 39.4% 11.2% 4.7% -.3	36 50.7% 15.2% 6.0% 1.5	7 9.9% 6.4% 1.2% -1.7	71 11.9%
PHARMACY	8	22 44.9% 8.8% 3.7% .3	15 30.6% 6.3% 2.5% -1.0	12 24.5% 10.9% 2.0% 1.0	49 8.2%
LIB ARTS	9	24 33.8% 9.6% 4.0% -1.0	25 35.2% 10.5% 4.2% -.6	22 31.0% 20.0% 3.7% 2.5	71 11.9%
	Column Total	249 41.8%	237 39.8%	110 18.5%	596 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
37.39565	16	.0018	6.829	None

Number of Missing Observations = 10

Table C-33

Standardized Residual Cross Tabulations: Rank by Question 11 (Economic Interdependence)

	Count Row Pct Col Pct Tot Pct Std Res	SLIGHTLY 1	RATHER 2	DECIDED 3	EXTREME 4	Row Total
RANK						
	1	13	81	97	72	263
PROFESSOR		4.9%	30.8%	36.9%	27.4%	43.0%
		31.0%	43.2%	38.5%	57.6%	
		2.1%	13.3%	15.9%	11.8%	
		-1.2	-.2	-1.1	2.5	
	2	18	60	87	33	198
ASSOCPROF		9.1%	30.3%	43.9%	16.7%	32.4%
		42.9%	31.3%	34.5%	26.4%	
		2.9%	9.8%	14.2%	5.4%	
		1.2	-.3	.6	-1.2	
	3	10	41	55	17	123
ASSTPROF		8.1%	33.3%	44.7%	13.8%	20.1%
		23.8%	21.4%	21.8%	13.6%	
		1.6%	6.7%	9.0%	2.8%	
		.5	.4	.6	-1.6	
	4	1	10	13	3	27
INSTRUCTR		3.7%	37.0%	48.1%	11.1%	4.4%
		2.4%	5.2%	5.2%	2.4%	
		.2%	1.6%	2.1%	.5%	
		-.6	.5	.6	-1.1	
Column Total		42	192	252	125	611
		6.9%	31.4%	41.2%	20.5%	100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
17.62384	9	.0398	1.856	1 of 16 (6.3%)

Number of Missing Observations = 9

BIOGRAPHICAL SKETCH

Born and raised in White Plains, New York, Judith Alison Wyman Gross obtained a Bachelor of Science degree in nursing from Alfred University in upstate New York in 1961. Her first position as a registered nurse was with the Monroe County Health Department in Rochester, New York. Between 1963 and 1975, she held a number of positions in a variety of settings while raising a family and accompanying a military husband to several localities.

Upon moving to Oklahoma in 1975, she was accepted into the Master of Science program of the University of Oklahoma College of Nursing. After receiving her degree in 1978, she taught nursing at Oklahoma Baptist University in Shawnee, Oklahoma. Prior to beginning doctoral studies at the University of Florida, Ms. Gross served as Continuing Care Clinical Specialist at The Children's Hospital in Boston, Massachusetts, where she served as discharge planning consultant to the hospital nursing staff.

Upon acceptance into doctoral studies in the Department of Educational Leadership, Ms. Gross worked full-time on her course work. After successfully completing requirements for candidacy for her Ph.D., she accepted a position as Assistant Professor at the College of Nursing of the Medical University of South Carolina in Charleston. In that capacity, she teaches undergraduate and graduate courses, serves on several college committees, and is active in professional nursing organizations in the Charleston area.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James L. Wattenbarger

James L. Wattenbarger, Chairman
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James E. Heald

James E. Heald
Professor of Educational Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Lois Malasanos

Lois J. Malasanos
Professor of Nursing

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1988

David C Smith LE

Dean, College of Education

Dean, Graduate School